

This Fleeting World

An Overview of Human History

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Thus shall ye think of all this fleeting world:

A star at dawn, a bubble in a stream,

A flash of lightning in a summer cloud,

A flickering lamp, a phantom, and a dream.

• THE DIAMOND SUTRA

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Introduction

World history focuses on the interconnections between people and communities in all eras of human history. Instead of telling the history of this nation or that community, it explores the histories of women and men across the entire world, the stories that all humans share just because they are human. Creating the history of humanity is one of the larger and more important goals of world history. Encyclopedias, however, encourage more sharply focused enquiries into the past. By convention, they divide their subject matter into manageable chunks, and then rearrange those chunks in alphabetical order, which is wonderful if you are researching particular topics, or just grazing. But such an organization can also obscure the larger picture. The overview of human history that follows in this section is designed to help readers keep sight of the unity of human history even as they enjoy the rich diversity of details, questions and approaches in the body of the encyclopedia.

Of course, no survey this brief can do more than sketch some of the main lines of development of our remarkable species, and it is probable that different histo-

rians would have drawn the lines in different ways. Nevertheless, as world history has evolved during the last fifty years or so, some consensus has emerged on the crucial turning points in human history. The three essays that follow are intended to distil something of that consensus, leaving more detailed treatments to the articles in the body of the encyclopedia. Besides, brevity has its advantages. Above all, it should be possible to read this survey in one or two sittings, a short enough period to remember the beginning of the story as you reach the end. Cross-references and bibliographical references will lead you quickly to other essays if you want to find out more about any particular subject.

My fellow editors (William McNeill, Jerry Bentley, Karen Christensen, David Levinson, John McNeill, Heidi Roupp, and Judith Zinsser) have been extremely generous in commenting on earlier drafts of these essays, and I want to thank them formally for their suggestions. However, I was stubborn enough not to accept all of their advice, so I alone must accept responsibility for remaining errors of fact, emphasis and balance.

David Christian

Comparing the Three Eras of Human History

<i>Era 1:</i> <i>FORAGING</i>	250,000–8000 BCE	Most of human history; small communities; global migrations; megafaunal extinctions; slow population growth
<i>Era 2:</i> <i>AGRARIAN</i>	8000 BCE–1750 CE	Intensification; rapid population growth; cities, states, empires; writing; different histories in different world zones
<i>Era 3:</i> <i>MODERN</i>	1750–Present	Single, global system; rapid growth in energy use; increasing rate of extinctions; increased life expectancies

Beginnings: The Era of Foragers



The era of foragers was the time in human history when all human communities lived by searching out or hunting food and other things they needed, rather than by growing or manufacturing them. Such people are also called “hunter-gatherers.” The era of foragers is also known as the “Paleolithic era” (*Paleolithic* means “old Stone Age”). The era of foragers was the first and by far the longest era of human history. It was the time when the foundations of human history were laid down.

Foragers gather the resources they need for food, for shelter and clothing, and for ritual activities and other purposes. For the most part they do so without trying to transform their environment. The exceptional cultural and technological creativity of human foragers distinguishes their lifeways (the many different ways in which people relate to their environments and to each other) from the superficially similar lifeways of nonhuman species, such as the great apes. Only humans can communicate using symbolic language. Language allows men and women to share and accumulate knowledge in detail and with great precision. As a result of this constant sharing of knowledge, the skills and lifeways of ancient foragers gradually adapted to a huge variety of environments, creating a cultural and technological variety that has no parallel among any other large species. The extraordinary facility with which human communities adapted to new circumstances and environments is the key to human history.

As far as we know, the earliest human beings were foragers; thus, the era of foragers began about 250,000 years ago, when modern humans—members of our own species, *Homo sapiens*—first appeared on Earth. Although some foraging communities exist even today, the era of

foragers ended about ten thousand years ago with the appearance of the first agricultural communities because after that time foraging ceased to be the only lifeway practiced by human societies.

Studying the Era of Foragers

Historians have had a difficult time integrating the era of foragers into their accounts of the past because most historians lack the research skills needed to study an era that generated no written evidence. Traditionally the era of foragers has been studied not by historians, but rather by archaeologists, anthropologists, and *prehistorians*.

In the absence of written evidence scholars use three other fundamentally different types of evidence to understand the history of this era. The first type consists of physical remains from past societies. Archaeologists study the skeletal remains of humans and their prey species, left-over objects such as stone tools and other manufactured objects or the remains of meals, as well as evidence from the natural environment that may help them understand climatic and environmental changes. We have few skeletal remains for the earliest phases of human history; the earliest known skeletal remains that are definitely of modern humans date from around 160,000 years ago.

For more on these topics, please see the following articles:

Archaeology p. 107 (v1)

Art, Paleolithic p. 180 (v1)

Dating Methods p. 487 (v2)

Human Evolution—Overview p. 930 (v3)

Paleoanthropology p. 1412 (v4)

Key Events in the Foraging Era

300,000– 200,000 BCE	Modern human beings appear in Africa.
250,000 BCE	Stone tool technology becomes more sophisticated.
200,000 BCE	Humans have spread across Africa.
100,000 BCE	Humans begin migrating out of Africa to Eurasia.
50,000 BCE	Development of more sophisticated technologies begins to accelerate. Large-scale extinction of many large land animals begins.
50,000– 40,000 BCE	Australia is settled.
30,000 BCE	Siberia is settled.
30,000– 20,000 BCE	More sophisticated tools such as the bow and arrow are invented.
13,000 BCE	North America is settled.
12,000 BCE	South America is settled.
10,000 BCE	The foraging era ends with the development of agriculture.

However, archaeologists can extract a surprising amount of information from fragmentary skeletal remains. A close study of teeth, for example, can tell us much about diets, and diets can tell us much about the lifeways of early humans. Similarly, differences in size between the skeletons of males and females can tell us something about gender relations. By studying fossilized pollens and core samples taken from sea beds and ice sheets that have built up during thousands of years, archaeologists have managed to reconstruct climatic and environmental

changes with increasing precision. In addition, the dating techniques developed during the last fifty years have given us increasingly precise dates, which allow us to construct absolute chronologies of events during the entire span of human history.

Although archaeological evidence tells us mostly about

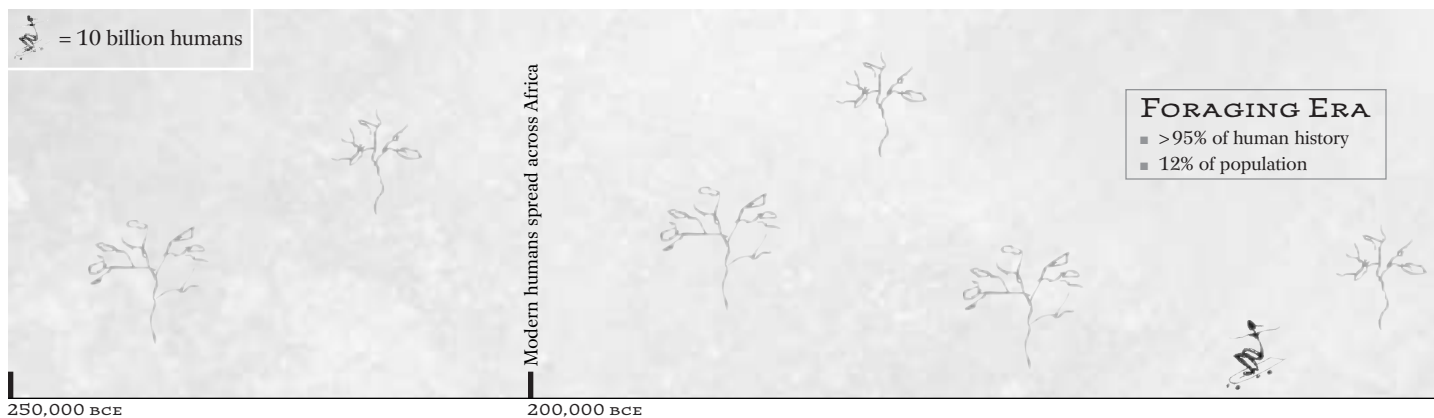
For more on these topics, please see the following articles:

Foraging Societies, Contemporary p. 764 (v2)

Genetics p. 809 (v2)

250,000 Years of Human History

(NOT DRAWN TO SCALE)



the material life of our ancestors, it can occasionally give us tantalizing glimpses into their cultural and even spiritual lives. Particularly revealing are the astonishing artistic creations of early human communities, although precise interpretations of artifacts such as the great cave paintings of southern France and northern Spain remain beyond our grasp.

The second major type of evidence used to study early human history comes from studies of modern foraging communities. Such studies must be used with caution because modern foragers are modern; their lifeways are all influenced in varying degrees by the modern world. Nevertheless, by studying modern foraging lifeways, we can learn much about basic patterns of life in small foraging communities; thus, such studies have helped prehistorians interpret the meager material evidence available.

Recently a third type of evidence, based on comparative studies of modern genetic differences, has provided new ways of studying early human history. Genetic studies can determine degrees of genetic separation between modern populations and can help us estimate both the age of our species and the dates at which different populations were separated by ancient migrations.

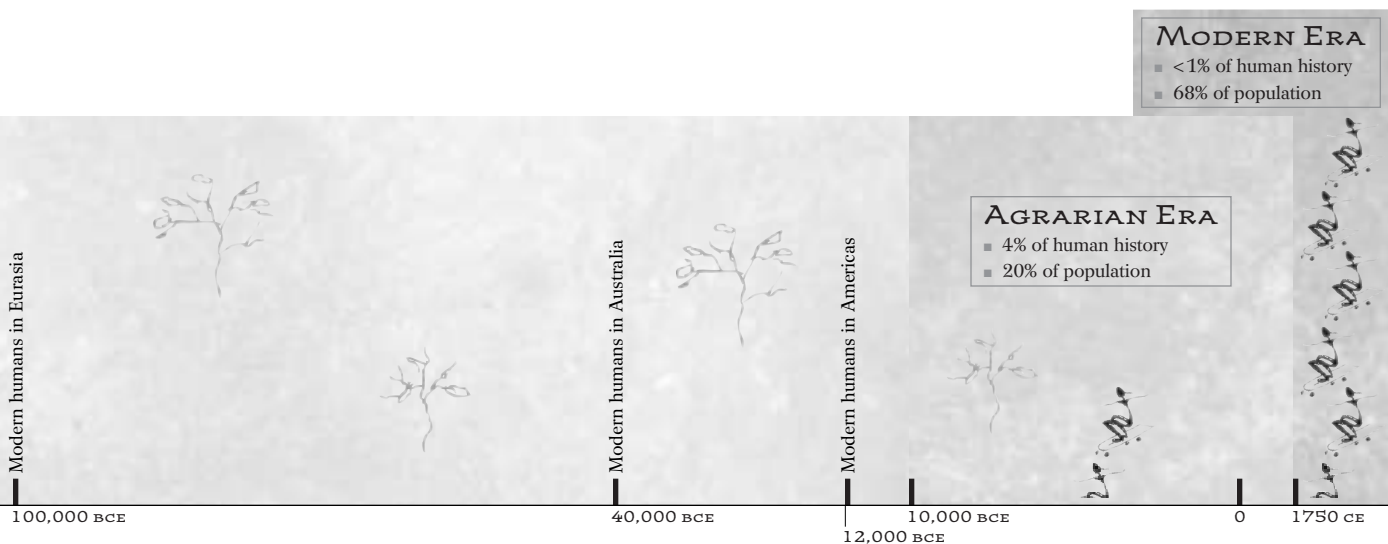
Integrating these different types of evidence into a coherent account of world history is difficult not only because most historians lack the necessary expertise and training, but also because archaeological, anthropologi-

Carbon Dating

Carbon 14 (hereafter C 14) was developed by the American chemist Willard F. Libby at the University of Chicago in the '50s, for which he received the Nobel Prize in Chemistry in 1960. C 14 dating provided an accurate means of dating a wide variety of organic material in most archaeological sites, and indeed in most environments throughout the world. The method revolutionized scientists' ability to date the past. It freed archaeologists from trying to use artifacts as their only means of determining chronologies, and it allowed them for the first time to apply the same absolute time scale uniformly from region to region and continent to continent. Many older archaeological schemes were overturned with the advent of C 14 dating. Today it is possible to date sites . . . well back into the late Pleistocene [Era] with reliable and accurate chronologies.

Source: Hudson, M. (n.d.). *Understanding Carbon 14 dating*. Retrieved September 8, 2004, from http://www.flmnh.ufl.edu/natsci/vertpaleo/auccilla10_1/Carbon.htm

cal, and genetic evidence yields types of information that differ from the written sources that are the primary research base for most professional historians. Archaeological evidence from the era of foragers can never give us the intimate personal details that can be found in written sources, but it can tell us much about how people lived. Integrating the insights of these different disciplines is one



Who Does What in the Study of Human History

Archaeologists excavate, preserve, study, and classify artifacts of the near and distant past in order to develop a picture of how people lived in earlier cultures and societies. The profession combines a broad understanding of history with sophisticated digging procedures and plain old hard work, making it one of the most demanding and competitive branches of the social sciences.

Source: Princeton Review. (2004). Retrieved September 8, 2004, from <http://www.princetonreview.com/cte/profiles/dayInLife.asp?careerID=10>

Prehistorian: An archaeologist who specializes in prehistory—the study of prehistoric humankind.

Source: Merriam-Webster Online. (2004). Retrieved September 8, 2004, from <http://www.m-w.com>

The word *anthropology* itself tells the basic story—from the Greek *anthropos* (“human”) and *logia* (“study”)—it is the study of humankind from its beginnings millions of years ago to the present day. . . . Though easy to define, anthropology is difficult to describe. Its subject matter is both exotic (e.g., star lore of the Australian aborigines) and commonplace (anatomy of the foot). And its focus is both sweeping (the evolution of language) and microscopic (the use-wear of obsidian tools). Anthropologists may study ancient Mayan hieroglyphics, the music of African Pygmies, and the corporate culture of a U.S. car manufacturer.

Source: American Anthropological Association. (2004). Retrieved September 8, 2004, from <http://www.aaanet.org/anthbroc.htm>

of the main challenges of world history, and it is faced most directly in studying the era of foragers.

Beginnings of Human History

Scholars still debate when our species first appeared. One hypothesis—the multiregional model, defended today by a minority of physical anthropologists, including Milford Wolpoff and Alan Thorne—states that modern humans evolved gradually, during the last million years, in many

regions of the Afro-Eurasian landmass. Through time, protohumans (early human ancestors) in different regions diverged enough to create the genetic foundations for modern regional variants (races) while maintaining sufficient genetic contact to remain a single species. The multiregional model implies that human history began, quite gradually, sometime during the last million years. The evidence for this model comes mainly from the comparative study of skeletal remains.

OUT OF AFRICA, INTO CONTROVERSY

A second hypothesis, sometimes known as the “Out-of-Africa hypothesis,” relies mainly on genetic comparisons of modern humans, although it also claims to be consistent with surviving skeletal evidence. It starts from the observation that modern humans are genetically very similar to each other, so similar in fact that they cannot have been evolving for more than about 250,000 years. This hypothesis suggests that all modern humans are descended from just a few ancestors who lived about 250,000 years ago. Today the greatest genetic variety among humans can be found in Africa, which suggests that Africa is where humans evolved and where they lived for the longest time before some began to migrate around the world. If the Out-of-Africa hypothesis is correct, modern humans evolved in Africa from later forms of *Homo ergaster*. The new species probably emerged quite rapidly in a remote, isolated group.

The Out-of-Africa hypothesis itself comes in two main variants. The first variant, which has long been defended by the archaeologist Richard Klein and others, suggests that even if modern humans evolved in Africa perhaps 250,000 years ago, the earliest evidence of distinctively human behaviors, including improved hunting skills and artistic activities of various kinds, dates from no earlier than about fifty thousand to sixty thousand years ago. In this variant humans were not fully human, and human

For more on these topics, please see the following articles:

Afro-Eurasia p. 44 (v1)

Human Evolution—Overview p. 930 (v3)

Periodization—Overview p. 1453 (v4)

The further you get away from any period, the better you can write about it. You aren't subject to interruptions by people that were there. • FINLEY PETER DUNNE (1867–1936)

history did not really begin until some minor genetic changes made available the full range of modern symbolic languages. This variant of the Out-of-Africa hypothesis depends on the proliferation of new types of tools and artifacts that is evident in the archaeology of Eurasia from about fifty thousand years ago.

More recently, however, some supporters of the Out-of-Africa hypothesis have argued that the significance of these changes may have been exaggerated by virtue of the fact that scholars have conducted so much more archaeological research in Eurasia than in Africa, the presumed homeland of modern humans. In a careful analysis of the available archaeological evidence from Africa, the anthropologists Sally McBrearty and Alison Brooks have argued that evidence of distinctively human activities appears in Africa as early as 200,000 to 300,000 years ago and coincides with the appearance of skeletal remains that may be those of the earliest modern men and women. If McBrearty and Brooks are right, our species appeared in Africa between 200,000 and 300,000 years ago, and these dates mark the real beginnings of human history. The periodization adopted in this essay is based on these findings. It adopts the compromise date of 250,000 years ago for the appearance of the first humans and for the beginnings of human history. However, we should remember that this date remains subject to revision.

WHAT MAKES US DIFFERENT?

What distinguishes us so markedly from other species? What distinguishes human history from the histories of all other animals? Many answers have been given to these fundamental questions. Modern answers include the ability to walk on two legs (bipedalism), the use of tools, the ability to hunt systematically, and the development of exceptionally large brains. Unfortunately, as studies of closely related species have become more sophisticated,

For more on these topics, please see the following articles:

Creation Myths p. 449 (v2)

Engines of History p. 654 (v2)

Language, Classification of p. 1106 (v3)

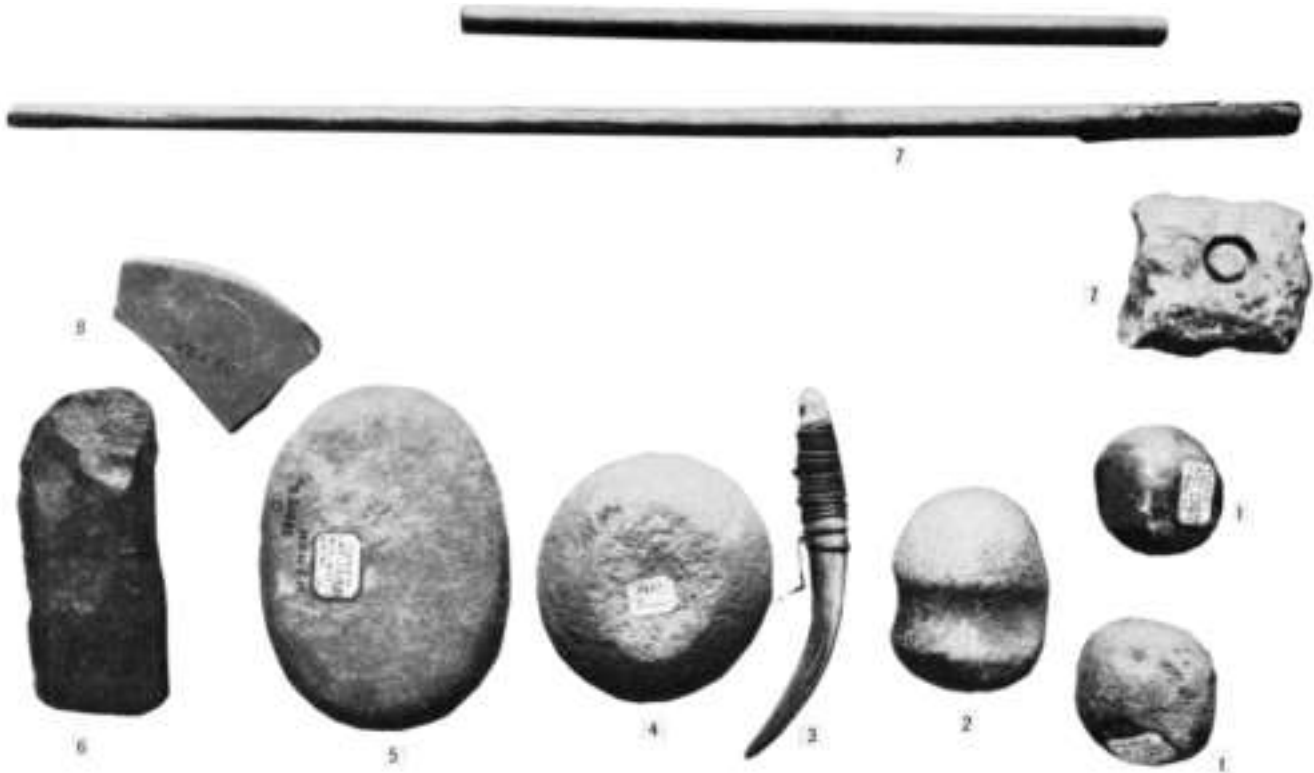
Language, Standardization of p. 1111 (v3)

we have learned that many of these qualities can be found to some degree in closely related species such as chimpanzees. For example, we now know that chimpanzees can make and use tools and can also hunt.

At the moment the most powerful marker, the feature that distinguishes our species most decisively from closely related species, appears to be symbolic language. Many animals can communicate with each other and share information in rudimentary ways. However, humans are the only creatures who can communicate using symbolic language: a system of arbitrary symbols that can be linked by formal grammars to create a nearly limitless variety of precise utterances. Symbolic language greatly enhanced the precision of human communication and the range of ideas that humans can exchange. Symbolic language allowed people for the first time to talk about entities that were not immediately present (including experiences and events in the past and future) as well as entities whose existence was not certain (such as souls, demons, and dreams).

The result of this sudden increase in the precision, efficiency, and range of human communication systems was that people could share what they learned with others; thus, knowledge began to accumulate more rapidly than it was lost: Instead of dying with each person or generation, the insights of individuals could be preserved for future generations. As a result, each generation inherited the accumulated knowledge of previous generations, and, as this store of knowledge grew, later generations could use it to adapt to their environment in new ways. Unlike all other living species on Earth, whose behaviors change in significant ways only when the genetic makeup of the entire species changes, humans can change their behaviors significantly without waiting for their genes to change. This cumulative process of collective learning explains the exceptional ability of humans to adapt to changing environments and changing circumstances and the unique dynamism of human history. In human history culture has outstripped natural selection as the primary motor of change.

These conclusions suggest that we should seek the beginnings of human history not only in the anatomical



This plate shows a variety of tools of increasing technological complexity used by humans at different times and places to shape stone. Tools 1–5 are used to flake or abrade stone. Tools 6 and 7 (long horizontal instruments and accompanying square to the right) are different parts of drills used with sand and tool 8 is a slate saw.

details of early human remains, but also in any evidence that hints at the presence of symbolic language and the accumulation of technical skills. The findings of McBrearty and Brooks link the earliest evidence of symbolic activity (including hints of the grinding of pigments for use in body painting) and of significant changes in stone tool technologies (including the disappearance of the stone technologies associated with most forms of *Homo ergaster*) with the appearance of a new species known as "*Homo helmei*." The remains of this species are so close to those of modern women and men that we may eventually have to classify them with our own species, *Homo sapiens*. The earliest anatomical, technological, and cultural evidence for these changes appears in Africa between 200,000 and 300,000 years ago.

Foraging Lifeways

Archaeological evidence is so scarce for the era of foragers that our understanding of early human lifeways has been shaped largely by conclusions based on the study of

modern foraging communities. Indeed, the notion of a foraging mode of production was first proposed by the anthropologist Richard Lee during the late 1970s on the basis of his studies of foraging communities in southern Africa. However, the scanty archaeological evidence can be used to discipline the generalizations suggested by modern anthropological research.

The scarcity of remains from this era, combined with what we know of the ecology of modern foragers, makes us certain that levels of productivity were extraordinarily low by modern standards. Humans probably did not extract from their environment much more than the 3,000 kilocalories per day that adult members of our species need to maintain a basic, healthy existence. Low

For more on these topics, please see the following articles:

Foraging Societies, Contemporary p. 764 (v2)

Indigenous Peoples p. 963 (v3)

Kinship p. 1083 (v3)

Marriage and Family p. 1195 (v3)



This plate shows the variety of stabbing tools used over the course of human history and the different sizes, shapes, and materials used to make the weapons. Tools 1-2 are made from flaked stone, 2 from antler, 3 from animal bone, 4 from antler, 5 through 8 from chipped stone, and 9 through 15 from copper, bronze, and iron.

productivity ensured that population densities were low by the standards of later eras, averaging perhaps as little as one person per square kilometer. This fact meant that small numbers of humans were scattered over large ranges. Modern studies suggest that foragers may have deliberately limited population growth to avoid over-exploitation of the land; modern foragers can limit population growth by inhibiting conception through prolonged breast feeding, by using various techniques of abortion, and sometimes by killing excess children or allowing the sick and unhealthy to die.

Because each group needed a large area to support itself, ancient foragers, like modern foragers, probably lived most of the time in small groups consisting of no more than a few closely related people. Most of these groups must have been nomadic in order to exploit their large home territories. However, we can also be sure that

many links existed between neighboring groups. Almost all human communities encourage marriage away from one's immediate family. Thus, foraging communities likely met periodically with their neighbors to swap gifts, stories, and rituals, to dance together, and to resolve disputes. At such meetings—similar, perhaps, to the corroborees of aboriginal Australians—females and males may have moved from group to group either spontaneously or through more formal arrangements of marriage or adoption.

KITH AND KIN

Exchanges of people meant that each group normally had family members in neighboring groups, creating ties that ensured that people usually had some sense of solidarity between neighboring groups as well as some linguistic overlapping. Ties of kinship created local networks

What we know of the past is mostly not worth knowing. What is worth knowing is mostly uncertain. Events in the past may roughly be divided into those which probably never happened and those which do not matter. • WILLIAM RALPH INGE (1860–1954)

that smoothed the exchange of goods, people, and ideas between neighboring groups.

Studies of modern foraging societies suggest that notions of family and kinship provided the primary way of thinking about and organizing social relations. Indeed, in *Europe and the People without History* (1982), the anthropologist Eric Wolf proposed describing all small-scale societies as “kin-ordered.” Family *was* society in a way that is difficult for the inhabitants of modern societies to appreciate. Notions of kinship provided all the rules of behavior and etiquette that were needed to live in a world in which most communities included just a few persons and in which few people met more than a few hundred other people in their lifetime.

The idea of society as family also suggests much about the economics of foraging societies. Relations of exchange were probably analogous to those in modern families. Exchanges were conceived of as gifts. This fact meant that the act of exchanging was usually more important than the qualities of the goods exchanged; exchanging was a way of cementing existing relationships. Anthropologists say that such relationships are based on “reciprocity.” Power relations, too, were the power relations of families or extended families; justice and discipline—even violent retribution for antisocial behavior—could be imposed only by the family. Hierarchies, insofar as they existed, were based on gender, age, experience, and respect within the family.

Studies of modern foraging societies suggest that, although males and females, just like older and younger members of society, may have specialized in different tasks, differences in the roles people played did not necessarily create hierarchical relations. Women probably took most responsibility for child rearing and may also have been responsible for gathering most of the food (at least in temperate and tropical regions, where gathering was more important than hunting), whereas men specialized in hunting, which was generally a less reliable source of food in such regions. However, no evidence indicates that these different roles led to relationships of dominance or subordination. Throughout the era of foragers

For more on these topics, please see the following articles:

Animism p. 90 (v1)

Shamanism p. 1696 (v4)

human relationships were personal rather than hierarchical. In a world of intimate, personal relationships people had little need for the highly institutionalized structures of the modern world, most of which are designed to regulate relationships between strangers.

Burials and art objects of many kinds have left us tantalizing hints about the spiritual world of our foraging ancestors but few definitive answers. Modern analogies suggest that foragers thought of the spiritual world and the natural world as parts of a large extended family, full of beings with whom one could establish relations of kinship, mutual obligation, and sometimes enmity. As a result, the classificatory boundaries that foragers drew between human beings and all other species and entities were less hard and fast than those we draw today. Such thinking may help make sense of ideas that often seem bizarre to moderns, such as totemism—the idea that animals, plants, and even natural geological objects such as mountains and lakes can be thought of as kin. The belief that all or most of reality is animated by spirit may be the fundamental cosmological hypothesis (or model of the universe) of foraging societies, even if particular representations of spirits differ greatly from community to community. The hypothesis helped make sense of a world in which animals and objects often behave with all the unpredictability and willfulness of human beings.

LIVING STANDARDS

In an article published in 1972 the anthropologist Marshall Sahlins questioned the conventional assumption that material living standards were necessarily low in foraging societies. He argued, mainly on the basis of evi-

For more on these topics, please see the following articles:

Disease and Nutrition p. 538 (v2)

Diseases—Overview p. 543 (v2)

Food p. 757 (v2)



Shamanism is a form of religion traced back to the foraging era. This drawing depicts a Siberian Shaman.

health of foragers was often better than that of people in the earliest farming communities. The small communities in which foragers lived insulated them from epidemic diseases, and frequent movement prevented the accumulation of rubbish that could attract disease-carrying pests. Modern analogies suggest that they also lived a life of considerable leisure, rarely spending more than a few hours a day in pursuit of the basic necessities of life—far less than most people either in farming communities or in modern societies. However, we should not exaggerate. In other ways life was undeniably harsh during the era of foragers. For example, life expectancies were probably low (perhaps less than thirty years): Although many persons un-

doubtedly lived into their sixties or seventies, high rates of infant mortality, physical accidents, and interpersonal violence took a greater toll from the young in foraging societies than in most modern societies.

Major Changes during the Era of Foragers

The small size of foraging communities and the limited possibilities for exchanging ideas over large areas may explain why, to modern minds, technological change during this era appears to have been so slow. Nevertheless, change was extremely rapid in comparison with the changes that took place among our hominid (erect bipedal primate mammals comprising recent humans and extinct ancestral and related forms) ancestors or among other large animal species. To give just one example, the Acheulian hand axes (a type of stone tool originating in Africa almost 2 million years ago) used by our immediate ancestors, *Homo ergaster*, changed little during a million and more years. Yet, during the 200,000

dence from modern foragers, that from some points of view we could view foragers (certainly those living in less harsh environments) as affluent. Nomadism discouraged the accumulation of material goods because people had to carry everything they owned; so did a lifeway in which people took most of what they needed from their immediate surroundings. In such a world people had no need to accumulate material possessions. Absence of possessions may seem a mark of poverty to modern minds, but Sahlins argued that foragers probably experienced their lives as affluent because the things they needed could be found all around them. Particularly in temperate regions, the diets of foragers can be varied and nutritious; indeed, the variety of the diets of ancient foragers shielded them from famine because when their favorite foodstuffs failed, they had many alternatives to fall back on.

LEISURELY BUT BRIEF

Studies by paleobiologists (paleontologists who study the biology of fossil organisms) have confirmed that the

The smallest human societies that we can identify either among living groups or among the populations of prehistory do not live up to the romantic images we sometimes paint of them . . . [but they] do surprisingly well if we compare them to the the actual record of human history rather than to

years or more of the era of foragers, our ancestors created a remarkable variety of new technologies and new lifeways. Indeed, the relatively sudden replacement of Acheulian stone technologies by more varied and precisely engineered stone tools in Africa from about 200,000 years ago is one of the most powerful reasons for thinking that modern humans existed by that date. Many of these new stone tools were so small that they may have been hafted (bound to handles), which would have greatly increased their versatility and usefulness.

The technological creativity of our foraging ancestors enabled them to explore and settle lands quite different from those in which they had evolved. Indeed, this creativity is one of the most decisive differences between our species and other species, including our closest relatives, the great apes. As far as we know, the great apes have not managed to modify their behaviors enough to migrate into new habitats. This fact is precisely why we do not customarily think of these species as having histories in the way that humans have a history. In contrast, the history of our species during the era of foragers is a story of many unrecorded migrations into new environments, made possible by tiny technological changes, the accumulation of new knowledge and skills, and minor adjustments in lifeways.

As humans spread over more and more of the Earth, human numbers surely increased. Estimates of populations during the era of foragers are based largely on guesswork, but one of the more influential recent estimates by demographer Massimo Livi-Bacci suggests that thirty thousand years ago just a few hundred thousand humans existed, whereas ten thousand years ago there may have been as many as 6 million. If we assume that approximately 500,000 humans existed thirty thousand years ago, this implies a growth rate between thirty thousand and ten thousand years ago of less than 0.01 percent per annum, which implies that human populations

were doubling approximately every eight thousand to nine thousand years. This rate of growth can be compared with an average doubling time of about fourteen hundred years during the agrarian era and eighty-five years during the modern era.

TECHNOLOGICAL CHANGE

Rates of growth during the era of foragers are striking in two contradictory ways. Insofar as population growth is an indirect sign of technological innovation, it provides evidence for innovation throughout the era and some signs that innovation was accelerating. However, by comparison with later eras of human history, rates of growth were extremely slow. This difference is partly because exchanges of information were limited by the small size and the wide dispersion of foraging communities. Indeed, change occurred so slowly that a person could hardly notice it within a single lifetime, and this fact may mean that ancient foragers, like modern foragers, had little sense of long-term change, seeing the past mainly as a series of variations on the present.

Migrations into new environments requiring new technologies and new skills probably began quite early during the era of foragers, while all humans still lived within the African continent. Unfortunately, studying technological change during the earliest stages of human history is difficult because surviving objects tell us little about the technological knowledge of those who made them. Today we depend upon objects such as cars and computers, which embody a colossal amount of specialized knowledge. However, modern anthropological studies suggest that among foragers knowledge was primarily carried in the head rather than embodied in objects. Thus, the tools that foragers left behind can give us only the palest impression of their technological and ecological skills.

Nevertheless, the evidence of change is powerful. The first piece of evidence that humans were migrating into new environments is the fact that human remains start appearing in all parts of the African continent. By 100,000 years ago some groups had learned to live off the resources of seashore environments, such as shellfish; whereas others were adapting to lifeways in other new

For more on these topics, please see the following articles:

Afro-Eurasia p. 44 (v1)

Migrations p. 1247 (v3)

Population p. 1484 (v4)

our romantic images of civilized progress. . . . Hobbes was probably wrong by almost any measure when he characterized primitive life as “nasty, brutish and short” while speaking from the perspective of urban centers of seventeenth-century Europe. • MARK COHEN, MEDICAL ANTHROPOLOGIST

environments, including tropical forests and deserts. Evidence that communities exchanged objects over distances up to several hundred kilometers suggests that communities were also exchanging information over considerable distances, and these exchanges may have been a vital stimulus to technological experimentation.

MIGRATIONS FROM AFRICA

From about 100,000 years ago humans began to settle outside Africa; communities of modern humans existed in southwestern Asia, and from there humans migrated west and east to the southern, and warmer, parts of the Eurasian landmass. These migrations took humans into environments similar to those of their African homeland; thus, they do not necessarily indicate any technological breakthroughs. Indeed, many other species had made similar migrations between Asia and Africa. However, the appearance of humans in Ice Age Australia by forty thousand to fifty thousand years ago is a clear sign of innovation because traveling to Australia demanded sophisticated seagoing capabilities, and within Australia humans had to adapt to an entirely novel biological realm. We know of no other mammal species that made this crossing independently.

Equally significant is the appearance of humans in Siberia from about thirty thousand years ago. To live in the steppes (vast, usually level and treeless tracts) of Inner Asia during the last ice age, you had to be extremely good at hunting large mammals such as deer, horse, and mammoth because edible plants were scarcer than in warmer climates. You also had to be able to protect yourself from the extreme cold by using fire, making close-fitting clothes, and building durable shelters. By thirteen thousand years ago humans had also reached the Americas, traveling either across the Ice Age land bridge of Beringia, which linked eastern Siberia and Alaska, or by sea around the coasts of Beringia. Within two thousand years of en-

tering the Americas, some groups had reached the far south of South America.

Each of these migrations required new technologies, new botanical and biological knowledge, and new ways of living; thus, each represents a technological breakthrough, within which numerous lesser technological adjustments took place as communities learned to exploit the particular resources of each microregion. However, no evidence indicates that the average size of human communities increased. During the era of foragers, technological change led to more extensive rather than more intensive settlement; humans settled more of the world, but they continued to live in small nomadic communities.

HUMAN IMPACTS ON THE ENVIRONMENT

The technological creativity that made these migrations possible ensured that, although foragers normally had a limited impact on their environments, their impact was increasing. The extinction of many large animal species (megafauna) and the spread of what is known as “fire-stick farming” provide two spectacular illustrations of the increasing human impact on the environment, although controversy still surrounds both topics.

Megafaunal Extinctions

Within the last fifty thousand years many species of large animals have been driven to extinction, particularly in regions newly colonized by humans, whether in Australia, Siberia, or the Americas. Australia and the Americas may have lost 70–80 percent of all mammal species weighing more than 44 kilograms; Europe may have lost about 40 percent of large-animal species; whereas Africa, where humans and large mammals had coexisted for much longer, lost only about 14 percent. As archaeologists pinpoint the date of these extinctions more precisely, they appear to coincide with the first arrival of modern

For more on these topics, please see the following articles:

Afro-Eurasia p. 44 (v1)

Asia p. 184 (v1)

Europe p. 691 (v2)

For more on these topics, please see the following articles:

Art, Paleolithic p. 180 (v1)

Extinctions p. 722 (v2)

Fire p. 745 (v2)

Technology—Overview p. 1806 (v5)

By providing a coherent, intelligible account of the past, [history] satisfies a profound human yearning for knowledge about our roots. It requires no justification other than that. • THEODORE S. HAMEROW (B. 1920)

humans, increasing the probability that they were *caused* by humans.

Similar extinctions during recent centuries, such as the extinction of the large birds known as “moas” in New Zealand, offer a modern example of what may have happened as humans with improved hunting techniques and skills encountered large animals who had little experience of humans and whose low reproduction rates made them particularly vulnerable to extinction. The loss of large-animal species in Australia and the Americas shaped the later histories of these regions insofar as the lack of large animals meant that humans were unable to exploit large animals as beasts of burden and sources of foodstuffs and fibers.

Fire-Stick Farming

A second example of the increasing environmental impact of early foragers is associated with what the Australian archaeologist Rhys Jones called “fire-stick farming.” Fire-stick farming is not, strictly, a form of farming at all. However, it is, like farming, a way of manipulating the environment to increase the productivity of animal and plant species that humans find useful. Fire-stick farmers regularly burn off the land to prevent the accumulation of dangerous amounts of fuel. Regular firing also clears undergrowth and deposits ash. In effect, it speeds up the decomposition of dead organisms, which encourages the growth of new shoots that can attract grazing animals and the animals that prey on them.

Humans systematically fired the land on all the continents they settled, and through time the practice probably transformed local landscapes and altered the mix of local animal and plant species. In Australia, for example, fire-stick farming through tens of thousands of years probably encouraged the spread of eucalyptus at the expense of species that were less comfortable with fire, creating landscapes very different from those encountered by the first human immigrants.

PICKING UP THE PACE

From about fifty thousand years ago the rate of technological change began to accelerate. Migrations to new

continents and new environments are one expression of that acceleration. However, new technologies and techniques also proliferated. Stone tools became more precise and more varied, and many may have been hafted. People made more use of new materials such as bone, amber, and vegetable fibers. From about twenty thousand to thirty thousand years ago, new and more sophisticated tools appeared, including bows and arrows and spear throwers.

Foragers in tundra (level or rolling treeless plain that is characteristic of arctic and subarctic regions) regions used bone needles to make carefully tailored clothes from animal skins; sometimes they covered their clothing with elaborate ornamentation made from animal teeth or shells. The remains of prey species show that hunters, particularly in cold climates, became more specialized in their hunting techniques, suggesting increasingly sophisticated understanding of different environments. Cave paintings and sculptures in wood or bone began to appear in regions as disparate as Africa, Australia, Mongolia, and Europe.

AFFLUENT FORAGERS

Accelerating technological change accounts for one more development that foreshadowed the changes that would eventually lead to the agrarian era. Most foraging technologies can be described as “extensive”: They allowed humans to occupy larger areas without increasing the size of individual communities. Occasionally, though, foragers adopted more intensive techniques that allowed them to extract more resources from a given area and to create larger and more sedentary communities. Evidence for such changes is particularly common from about twenty thousand to fifteen thousand years ago and is best known from the corridor between Mesopotamia (the region of southwestern Asia between the Tigris and Euphrates rivers) and Sudan—the region that links Africa and Eurasia. Anthropologists have long been aware that foragers living in environments of particular abundance will sometimes become less nomadic and spend longer periods at one or two main home bases. They may also become more sedentary if they devise technologies that



Indigenous peoples of the North American northwest subsisted from fishing and exhibited a way of life called affluent foraging. The illustration is of the designs on a large Tsimshian box used to store blankets, an important form of wealth.

increase the output of resources from a particular area. Anthropologists refer to such foragers as “affluent foragers.”

The examples that follow are taken from Australia from a region in which foraging lifeways can be studied more closely because they have survived into modern times. During the last five thousand years new, smaller, and more finely made stone tools appeared in many parts of Australia, including small points that people may have used as spear tips. Some tools were so beautifully made that they were traded as ritual objects over hundreds of miles. New techniques meant new ways of extracting resources. In the state of Victoria people built elaborate eel traps, some with canals up to 300 meters long. At certain points people constructed nets or tapered traps, using bark strips or plaited rushes, to harvest the trapped eels. So many eels could be kept in these eel



farms that relatively permanent settlements appeared nearby. One site contains almost 150 small huts built of stone. In addition to eels, the inhabitants of these small settlements lived off local species of game, from emu to kangaroo, as well as local vegetable foods such as daisy yam tubers, ferns, and convolvulus (herbs and shrubs of the morning glory family).

Some communities began to harvest plants such as yams, fruit, and grains in ways that suggest early steps towards agriculture. Yams were (and are today) harvested in ways that encouraged regrowth, and people deliberately planted fruit seeds in refuse heaps to create fruit groves. In some of the more arid areas of central Australia, early European travelers observed communities harvesting wild millet with stone knives and storing it in large haystacks. Archeologists have discovered grindstones, which were used to grind seeds as early as fifteen thousand years ago in some regions. In many coastal regions of Australia fishing using shell fishhooks and small boats also allowed for denser settlement. In general, the coasts were more thickly settled than inland areas.

The appearance of communities of affluent foragers prepared the way for the next fundamental transition in human history: the appearance of communities that systematically manipulated their environments to extract more resources from a given area. The set of technologies that these people used is often called “agriculture”; we refer to the era in which agriculture made its appearance as the “agrarian era.”

The Era of Foragers in World History

Historians have often assumed that little changed during the era of foragers. In comparison with later eras of human history this assumption may seem to be true. It is also true that change was normally so slow that it was imperceptible within a single lifetime; thus, few men and women in the era of foragers could have appreciated the wider significance of technological changes. Nevertheless, in comparison with the prehuman era, the pace of technological change during the era of foragers was striking.



A selection of Foraging Era flaked arrowheads from (1) Ireland; (2) France; (3) North America; (4) South America; and (5) Japan.

Exploiting the technological synergy (the creative power generated by linking people through language) that was made available to humans by their capacity for symbolic language, human communities slowly learned to live successfully in a wide variety of new environments. A gradual accumulation of new skills allowed foraging communities to settle most of the world in migrations that have no precedent either among other primate species or among our hominid ancestors.

During the course of 250,000 years the pace of change was slowly accelerating. During the last fifty thousand years or so, the variety and precision of foraging technologies and techniques multiplied throughout the world. Eventually foraging technologies became sophisticated enough to allow groups of people in some regions to exploit their surroundings more intensively, a change that marks the first step toward agriculture.

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Acceleration: The Agrarian Era



The agrarian era began ten thousand to eleven thousand years ago with the appearance of the first agricultural communities. We can define the agrarian era as “the era of human history when agriculture was the most important of all productive technologies and the foundation for most human societies.” It ended during the last 250 years as modern industrial technologies overtook agriculture in productivity and began to transform human lifeways. Although the agrarian era lasted a mere ten thousand years, in contrast to the 250,000 years of the era of foragers, 70 percent of all humanity may have lived during the agrarian era, their burgeoning numbers sustained by the era’s productive technologies.

The agrarian era was characterized by greater diversity than either the era of foragers or the modern era. Paradoxically, diversity was a product both of technological innovations and of technological sluggishness because although new technologies such as agriculture and pastoralism (livestock raising) created new ways of living, the limits of communications technologies ensured that different parts of the world remained separate enough to evolve along independent trajectories. At the largest scale we can identify several distinct “world zones,” or regions that had no significant contact with each other before about 1500 CE. The most important were the Afro-Eurasian landmass from the far south of Africa to the far northeast of Siberia, the Americas, Australia, and the islands of the Pacific.

Within each world zone long and sometimes tenuous webs of cultural and material exchanges linked local communities into larger networks of exchanges. In some of the world zones the dense networks of political, cultural,

and economic exchanges known as “agrarian civilizations” emerged, and through time these civilizations linked with other agrarian civilizations and with peoples living between the main zones of agrarian civilization. However, we know of no significant contacts between the different world zones before 1500 CE. The great diversity of lifeways and the relative isolation of different regions explain why we have more difficulty making generalizations that apply to the entire world during this era than during the era of foragers or the modern era.

Despite this diversity, striking parallels exist between the historical trajectories of different parts of the world. Agriculture appeared quite independently in several regions; so did states, cities, monumental architecture, and writing. These parallels raise deep questions about long-term patterns of historical change. Does human history have a fundamental shape, a large trajectory that is apparent in all regions and under diverse social and ecological conditions? If such a shape exists, does it arise from the nature of our species or from basic principles of cultural evolution? Or are the similarities misleading? Do the diversity and open-endedness of human historical experience deserve most emphasis on the large scales of world history?

Origins of Agriculture

The word *agriculture* is used here to describe an evolving cluster of technologies that enabled humans to increase the production of favored plant and animal species. Ecologically speaking, agriculture is a more efficient way than foraging to harvest the energy and resources stored in the natural environment as a result of photosynthesis.

Agriculture represents the single most profound ecological change in the entire 3.5 billion-year history of life. • NILES ELDREDGE (B. 1943)

Because farmers interfere with their surroundings more deliberately than foragers, agriculture magnified the human impact on the natural environment and also on the cultures and lifeways of humans themselves. Agriculturalists manipulated plant and animal species so intensely that they began to alter the genetic makeup of prey species in a process commonly referred to as “domestication.” By clearing forests, diverting rivers, terracing hillsides, and plowing the land, agriculturalists created landscapes that were increasingly anthropogenic (shaped by human activity).

Finally, by altering their own lifeways, agriculturalists created new types of communities, radically different in scale and complexity from those of the era of foragers. Humans did not domesticate just other species; they also domesticated themselves.

Agriculture does not automatically increase the biological productivity of the land. Indeed, agriculturalists often reduce total productivity by removing the many species for which they have no use. They increase the productivity only of those plants and animals that they find most useful; removing undesired plants leaves more nutrients, sunlight, and water for domesticated crops such as corn, wheat, or rice, while killing wolves and foxes allows cattle, sheep, and chickens to flourish in safety. By increasing the productivity of favored prey species, humans

could feed more of themselves from a given area than would have been possible using foraging technologies.

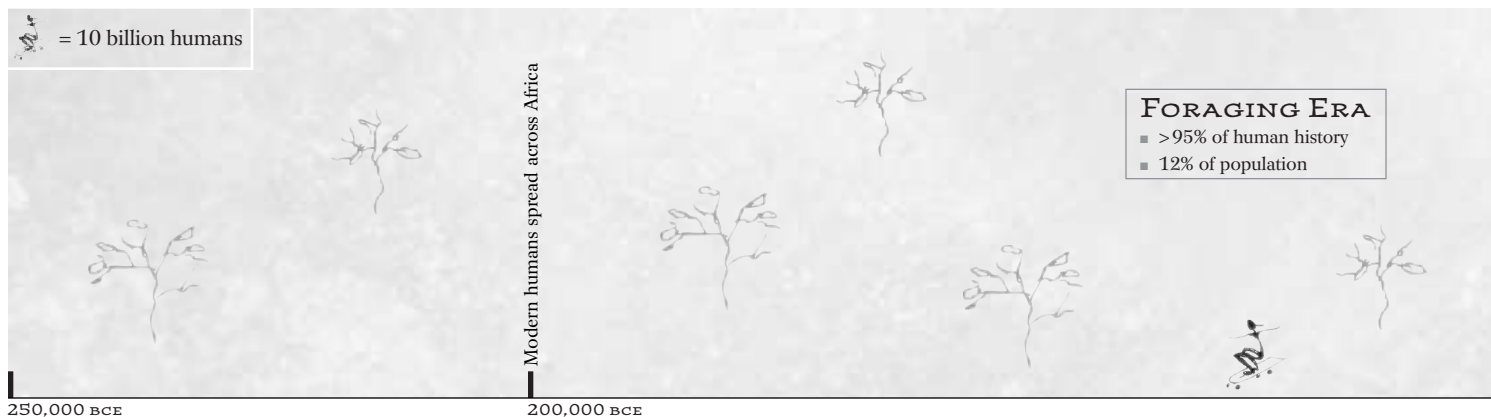
Whereas technological change during the era of foragers was extensive (it allowed humans to multiply by increasing their range), technological change during the agrarian era was intensive (it allowed more humans to live within a given range). As a result, humans and their domesticates began to settle in larger and denser communities; as they did so they transformed their ecological and social environments. The result was a revolution in the pace and nature of historical change.

EARLIEST EVIDENCE OF AGRICULTURE

Dates for the earliest evidence of agriculture remain subject to revision. At present the earliest clear evidence comes from the corridor between Sudan and Mesopotamia that links Africa and Eurasia. In the Fertile Crescent (the arc of highlands around the great rivers of Mesopotamia) grain crops were cultivated from about 8000 BCE (ten thousand years ago). In the Sahara Desert west of the Nile River, in lands that then were much less arid than they are today, communities may have domesticated cattle as early as 9000 or 8000 BCE, and within a thousand years these same communities may have started cultivating sorghum. In west Africa yam cultivation may also have begun around 8000 BCE. In China people were

250,000 Years of Human History

(NOT DRAWN TO SCALE)



Key Events in the Agrarian Era

13,000– 11,000 BCE	Some humans begin to live in settled communities.
9000– 8000 BCE	Cattle are domesticated in the Sahara region of Africa.
8000 BCE	Grain crops are cultivated in Mesopotamia. Yams are cultivated in West Africa.
7000 BCE	Grains and rice are cultivated in the north and south of China. Yams and taro are cultivated in Papua New Guinea. Squash is cultivated in Mesoamerica.
4000 BCE	The secondary products revolution takes place in parts of Afro-Eurasia.
3000 BCE	Plants are cultivated in the Andes region of South America. Cities and states appear in Mesopotamia and Egypt.
2500 BCE	Cities and states appear in India, Pakistan and northern China.
2000 BCE	Eurasian trade networks develop.
1000 BCE	Cities and states appear in Mesoamerica and the Andes.
500 BCE– 1000 CE	New cities and states emerge, population increases, and interregional trade networks develop.
500–1200 CE	Many of the Pacific islands are settled.
1200 CE	Europeans reach the Americas.
1500 CE	All major world regions are linked through migration and trade.
1750 CE	The Agrarian Era begins to decline with the appearance and spread of industrialization.

MODERN ERA

- < 1% of human history
- 68% of population

AGRARIAN ERA

- 4% of human history
- 20% of population

Modern humans in Eurasia

100,000 BCE

Modern humans in Australia

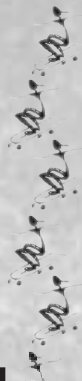
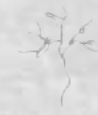
40,000 BCE

Modern humans in Americas

12,000 BCE

0

1750 CE



In truth, the historian can never get away from the question of time in history: time sticks to his thinking like soil to a gardener's spade. • FERNAND BRAUDEL (1902–1985)

For more on these topics, please see the following articles:

Andean States p. 86 (v1)

China p. 332 (v1)

Egypt, Ancient p. 629 (v2)

Mesoamerica p. 1230 (v3)

Mesopotamia p. 1235 (v3)

probably cultivating rice in the south and other grains in the north by 7000 BCE. By this time farming based on the cultivation of taro (a large-leaved tropical Asian plant) and yam evidently existed in Papua New Guinea in the Malay Archipelago. Communities probably farmed root crops early in many coastal communities in the tropics, although most traces of such communities would have been submerged as sea levels rose at the end of the last ice age. In Mesoamerica (the region of southern North America that was occupied during pre-Columbian times by peoples with shared cultural features) people probably domesticated squash as early as 7000 BCE, but clearer evidence of systematic agriculture does not appear before 5000 BCE; in the Andes region the earliest evidence comes after about 3000 BCE. From these and perhaps a few other regions in which agriculture appeared quite independently, agricultural technologies and ways of life eventually spread to most of the world.

At present we lack a fully satisfactory explanation for the origins of agriculture. Any explanation must account for the curious fact that, after 200,000 years or more during which all humans lived as foragers, agricultural lifestyles appeared within just a few thousand years in parts of the world that had no significant contact with each other. The realization that agriculture arose quite independently in different parts of the world has undermined the once-fashionable view that agriculture was a brilliant invention that diffused from a single center as soon as people understood its benefits. That view was also undermined after researchers realized that foragers who know about agriculture have often preferred to remain foragers. Perhaps foragers resisted change because the health and nutritional levels of the first farmers were often lower than those of neighboring foragers, whereas their stress levels were often higher. If agriculture depressed liv-

ing standards, then an explanation of the origins of agriculture must rely more on “push” than on “pull” factors. Rather than taking up agriculture willingly, we must assume that many early agriculturalists were forced to take it up.

AFFLUENT FORAGERS

The outlines of such an explanation are now available, even if many details remain to be tested in particular instances. The origins of agriculture have been studied most thoroughly in Mesopotamia and in Mesoamerica. In both areas the first agricultural villages appeared after many centuries during which foragers intensified their exploitation of particular favored resources, adapting their tools and techniques with increasing precision and efficiency to local environments. This was the first step towards agriculture. When taken far enough, such techniques can turn conventional foragers into what anthropologists call “affluent foragers.” Affluent foragers extract more resources from a given area than traditional foragers. Eventually they may extract enough resources to become semisedentary, living in one place for much of the year. This development is particularly likely where prey resources such as fish or wild grains are unusually abundant. The appearance of such communities in many parts of the world toward the end of the last ice age tempts us to link such changes with the erratic global warming that began sixteen thousand to eighteen thousand years ago.

In both temperate and tropical zones warmer climates may have created local “gardens of Eden”—regions of exceptional abundance—where highly nutritious plants such as wild wheats that had once been scarce thrived and spread. Indeed, intensive agriculture may have been impossible under the harsh conditions of the last ice age; if so, the end of the last ice age was a crucial enabling feature, making agriculture possible for the first time in perhaps 100,000 years.

For more on these topics, please see the following articles:

Carrying Capacity p. 297 (v1)

Foraging Societies, Contemporary p. 764 (v2)

Indigenous Peoples p. 963 (v3)



The end of the last ice age also coincided with the final stages of the great global migrations of the era of foragers. As the anthropologist Mark Cohen has pointed out, by the end of the last ice age few parts of the world were unoccupied, and some parts of the world may have been overpopulated, at least by the standards of foragers. Perhaps the coincidence of warmer, wetter, and more productive climates with increasing population pressure in some regions explains why, in several parts of the world beginning ten thousand to eleven thousand years ago, some communities of foragers began to settle down. The classic example of this change comes from the Natufian communities of the fertile highlands around Mesopotamia fourteen thousand to twelve thousand years ago. Natufian communities were largely sedentary but lived as foragers, harvesting wild grains and gazelle. Similar communities, harvesting wild sorghum, may have existed even earlier in modern Ethiopia, east of the Nile River.

FULL-BLOWN AGRICULTURE

Eventually some sedentary or semisedentary foragers became agriculturalists. The best explanation for this second stage in the emergence of agriculture may be demographic. As mentioned earlier, modern studies of nomadic foragers suggest that they can systematically limit population growth through prolonged breast feeding (which inhibits ovulation) and other practices, including infanticide and senilicide (killing of the very young and the very old, respectively). However, in sedentary communities in regions of ecological abundance such restraints were no longer necessary and may have been relaxed. If so, then within just two or three generations sedentary foraging communities that had lived in regions of abundance for a generation or two may have found that they were outstripping available resources once again.

Overpopulation would have posed a clear choice: Migrate or intensify (produce more food from the same area). Where land was scarce and neighboring communities were also feeling the pinch, people may have had no choice at all; sedentary foragers had to intensify. However, even those foragers able to return to their traditional,

For more on these topics, please see the following articles:

Agricultural Societies p. 52 (v1)

Cereals p. 321 (v1)

Population p. 1484 (v4)

Water Management p. 2036 (v5)

nomadic lifeways may have found that in just a few generations they had lost access to the lands used by their foraging ancestors and had also lost their traditional skills as nomadic foragers. Those communities that chose to intensify had to apply already-existing skills to the task of increasing productivity. They already had much of the knowledge they needed: They knew how to weed, how to water plants, and how to tame prey species of animals. The stimulus to apply such knowledge more precisely and more systematically was provided by overpopulation, whereas global warming made intensification feasible.

These arguments appear to explain the curious near-simultaneity of the transition to agriculture at the end of the last ice age. They also fit moderately well what is known of the transition to agriculture in several regions, particularly temperate regions where agriculture was based primarily on grains. They also help explain why, even in regions where developed agriculture did not appear, such as Australia, many of the preliminary steps toward agriculture do show up in the archaeological record, including the appearance of affluent, semisedentary foragers.

SEEDS OF CHANGE

After agriculture had appeared in any one region, it spread, primarily because the populations of farming communities grew much faster. Although agriculture may have seemed an unattractive option to many foragers, farming communities usually had more resources and more people than foraging communities. When conflict occurred, more resources and more people usually meant that farming communities also had more power. Agriculture spread most easily in regions that bordered established agricultural zones and that had similar soils, climates, and ecologies. Where environmental conditions were different, the spread of agriculture had to await

new techniques such as irrigation or new crops better adapted to the regions of new settlement.

Such changes are apparent, for example, as agriculture spread from southwestern Asia into the cooler and usually wetter environments of eastern, central, and northern Europe or as maize cultivation spread northward from Mesoamerica, a process that depended in part on subtle genetic changes in local varieties of maize. Where new techniques were not available, foragers survived much longer, and the spread of agriculture could be checked, sometimes for thousands of years, as it was at the edge of the Eurasian steppes, which were not brought into cultivation until modern times. Usually agriculture spread through a process of budding off as villages became overpopulated and young families cleared and settled suitable land beyond the borders of their home villages.

General Characteristics and Long Trends

Agricultural communities share important characteristics that give the agrarian era an underlying coherence despite its extraordinary cultural diversity. These characteristics include societies based on villages, demographic dynamism, accelerated technological innovation, the presence of epidemic disease, new forms of power and hierarchy, and enduring relations with nonagrarian peoples.

VILLAGE-BASED SOCIETIES

At the base of all agrarian societies were villages, more or less stable communities of farming households. Although the crops, the technologies, and the rituals of villagers varied greatly from region to region, all such peasant communities were affected by the annual rhythms of harvesting and sowing, the demands of storage, the need for



This drawing shows what an ancient lake-dweller community in Denmark might have looked like.

cooperation within and among households, and the need to manage relations with outside communities.

DEMOGRAPHIC DYNAMISM

The increased productivity of agriculture ensured that populations grew much faster than they had during the era of foragers. Rapid population growth ensured that villages and the technologies that sustained them would eventually spread to all regions in which agriculture was viable. Modern estimates suggest that during the agrarian era world populations rose from 6 million ten thousand years ago to 770 million in 1750. Although these figures hide enormous regional and chronological differences, they are equivalent to an average growth rate of approximately 0.05 percent per annum; on average, populations were doubling every fourteen hundred years. This rate can be compared with doubling times of eight thousand to nine thousand years during the era of foragers and approximately eighty-five years during the modern era.

For more on these topics, please see the following articles:

Agricultural Societies p. 52 (v1)

Carrying Capacity p. 297 (v1)

Disease and Nutrition p. 538 (v2)

Diseases—Overview p. 543 (v2)

Diseases, Animal p. 551 (v2)

Diseases, Plant p. 558 (v2)

Long Cycles p. 1160 (v3)

Matriarchy and Patriarchy p. 1218 (v3)

Population p. 1484 (v4)

Secondary-Products Revolution p. 1680 (v4)

Water Management p. 2036 (v4)

ACCELERATED TECHNOLOGICAL INNOVATION

Local population pressure, expansion into new environments, and increasing exchanges of ideas and goods encouraged many subtle improvements in agricultural techniques. Most improvements arose from small changes in the handling of particular crops, such as earlier or later planting, or the selection of better strains. However, on a broader scale, increased productivity arose from whole clusters of innovation that appeared in many environments. Swidden agriculturalists cleared forest lands by fire and sowed crops in the ashy clearings left behind; after a few years, when the soil's fertility was exhausted, they moved on. In mountainous areas farmers learned how to cultivate hillsides by cutting steplike terraces.

Secondary-Products Revolution

One of the most important of these clusters of innovation had its primary impact only in the Afro-Eurasian world zone: The archaeologist Andrew Sherratt has called it the "secondary-products revolution." From about 4000 BCE a series of innovations allowed farmers in Afro-Eurasia to make more efficient use of the secondary products of large livestock—those products that could be exploited without slaughtering the animals. Secondary products include fibers, milk, manure for fertilizer, and traction power to pull plows, carry people, and transport goods. In arid regions, such as the steppes of Eurasia, the deserts of southwestern Asia, or the savanna lands of east Africa, the secondary-products revolution generated the entirely new lifeway of pastoralism as entire communities learned to live off the products of their herds. Unlike members of the farming communities that were most typical of the agrarian era, pastoralists were usually nomadic because in the dry grasslands in which pastoralism flourished livestock had to be moved constantly to provide them with enough feed.

However, the main impact of the secondary-products revolution was in farming areas, where horses, camels, and oxen could be used to pull heavy plows and to transport goods and humans. The domestication of llamas meant that South America had some experience of the secondary-products revolution, but its major impact was

The "Secondary-Products" Revolution

As illustrated by the excerpt below from the University of Oxford website, the "secondary-products" revolution is a theory that continues to be tested on artifacts dating back more than 6,000 years.

The first [project] involves the participation of Professor Andrew Sherratt of the School of Archaeology of the University of Oxford and curator of the European prehistoric collections in the Ashmolean Museum. It was he who suggested that the first domestic animals may have been used not for their "secondary products" (milk, wool, hair and traction), but for meat, and that milking and the exploitation of other secondary animal products became part of prehistoric farming practices only around 4000 BCE. This socio-economic transition helped promote social evolutionary changes such as the birth of pastoral nomadic communities, the emergence of the Mediterranean farming economy and the rise of complex State-level societies.

The Oxford Levantine Archaeology laboratory has provided pottery sherds from vessels found in Israel's Negev desert dating from c. 4500–4000 BCE to test Sherratt's "secondary-products-revolution" hypothesis by analysing residues for evidence of milk. The samples are currently being tested in Professor Richard Evershed's Biogeochemistry Research Centre at the University of Bristol.

Source: Oxford Centre for Hebrew and Jewish Studies. (2004). Retrieved September 8, 2004, from <http://users.ox.ac.uk/~ochjs/levantine.html>

felt in the Afro-Eurasian world zone because most potential domesticates had been driven to extinction in the Americas during the era of foragers. Many of the critical differences between the histories of Afro-Eurasia and the Americas may depend, ultimately, on this key technological difference.

Just Add Water

The techniques of water management known collectively as "irrigation" had an even greater impact on agricultural

Terracing

Terraced fields snaking up hillsides are spectacular sights and major tourist attraction in Southeast Asian nations such as the Philippines and Indonesia. Some of the terraces have been maintained for over 2000 years. The following extract describing the types of terraces built by the Ifugao ethnic group of the northern Philippines indicates that terracing is more complex than it appears from a distance.

Habal “swidden” (slope field, camote field, kaingin). Slopeland, cultivated and often contour-ridged (and especially for sweet potatoes). Other highland dry-field crops (including taro, yams, manioc, corn, millet, mongo beans, and pigeon peas, but excluding rice except at elevations below 600–700 meters (2,000 feet) above sea level) are also cultivated in small stands or in moderately intercropped swiddens. Boundaries remain discrete during a normal cultivation cycle of several years. When fallow, succession is usually to a canegrass association. . . .

lattan “house terrace” (settlement, hamlet terrace, residential site). Leveled terrace land, the surface of which

is packed smooth or paved but not tilled; serving primarily as house and granary yards, work space for grain drying, and so forth; discrete, often fenced or walled, and named. . . .

qilid “drained field” (drained terrace, ridged terrace). Leveled terrace land, the surface of which is tilled and ditch mounded (usually in cross-contour fashion) for cultivation and drainage of dry crops, such as sweet potatoes and legumes. Drained fields, though privately owned, are kept in this temporary state for only a minimum number of annual cycles before shifting (back) to a more permanent form of terrace use. . . .

payo “pond field” (bunded terrace, rice terrace, rice field). Leveled farmland, bunded to retain irrigation water for shallow inundation of artificial soil, and carefully worked for the cultivation of wet-field rice, taro, and other crops; privately owned discrete units with permanent stone markers; the most valued of all land forms.

Source: Conklin, H. C. (1967–68). Some Aspects of Ethnographic Research in Ifugao. *New York Academy of Sciences, Transactions*, ser. 2, 30, 107–108.

productivity. Irrigation farmers diverted small streams onto their fields, created new farm land by filling swamps with soil and refuse, or built systematic networks of canals and dams to serve entire regions. People practiced irrigation of some kind in Afro-Eurasia, in the Americas, and even in Papua New Guinea and the Pacific. Its impact was greatest in arid regions with fertile soils, such as the alluvial basins (regions whose soils were deposited by running water) of Egypt, Mesopotamia, the northern regions of the Indian subcontinent, northern China, and the lowlands of the Andean region. In these regions irrigation agriculture led to exceptionally rapid population growth.

As agriculture spread and became more productive, it supported larger, denser, and more interconnected communities. Within these communities population pressure and increasing exchanges of information generated a steady trickle of innovations in building, warfare, record keeping, transportation and commerce, and science and the arts. These innovations stimulated further demographic growth in a powerful feedback cycle that explains

why change was so much more rapid during the agrarian era than during the era of foragers. Yet, innovation was rarely fast enough to keep up with population growth. This lag explains why, on the scale of decades or even centuries, all agrarian societies experienced cycles of expansion and collapse that obscured the underlying trend toward growth. These cycles underlay the more visible patterns of political rise and fall, commercial boom and bust, and cultural efflorescence (blooming) and decay that have so fascinated historians. (Such patterns of growth and decline can be described as “Malthusian cycles,” after Thomas Malthus, the nineteenth-century English economist who argued that human populations will always rise faster than the supply of food, leading to periods of famine and sudden decline.)

EPIDEMIC DISEASES

Population growth could be slowed by epidemic diseases as well as by low productivity. Foraging communities were largely free of epidemic diseases because they were



A selection of stone and bronze implements recovered from agrarian era state-level centers in Mesoamerica. (1) axe; (2) bracelets; (3) arrow points; (4) stone axe; and (5) bronze knife.

small and mobile, but farming communities created more favorable environments for pathogens (causative agents of disease). Close contact with livestock allowed pathogens to move from animals to humans, accumulations of rubbish provided fertile breeding grounds for diseases and pests, and large communities provided the abundant reserves of potential victims that epidemic diseases need to flourish and spread. Thus, as populations grew and exchanges between communities multiplied, diseases traveled more freely from region to region. Their impact took the form of a series of epidemiological decrescendos that began with catastrophic epidemics and were followed by less disastrous outbreaks as immune systems in region after region adapted to the new diseases.

As the historian William McNeill has shown, long-range epidemiological exchanges within the Afro-Eurasian world zone immunized the populations of this zone against a wide range of diseases to which populations in other world zones remained more vulnerable. Trans-Eurasian epidemiological exchanges may help explain the slow growth of much of Eurasia during the first millennium CE; they may also explain why, once the world was united after 1500 CE, epidemiological exchanges had a catastrophic impact on regions outside Afro-Eurasia.

HIERARCHIES OF POWER

In many tropical regions people harvested root crops piecemeal as they were needed. However, in regions of grain farming, such as southwestern Asia, China, and Mesoamerica, plants ripened at the same time; thus, entire crops had to be harvested and stored in a short period. For this reason grain agriculture required people, for the first time in history, to accumulate and store large

surpluses of food. As villages of grain farmers multiplied and their productivity rose, the size of stored surpluses grew. Conflicts over control of these increasingly valuable surpluses often triggered the emergence of new forms of inequality and new systems of power.

Stored surpluses allowed communities for the first time to support large numbers of nonfarmers: specialists such as priests, potters, builders, soldiers, or artists who did not farm but rather supported themselves by exchanging their products or services for foodstuffs and other goods. As farmers and nonfarmers exchanged goods and services, a complex division of labor appeared for the first time in human history. Specialization increased interdependence between households and communities and tightened the webs of obligation and dependence that bound individuals and communities together. Eventually surpluses grew large enough to support elite groups whose lives depended primarily on their ability to control and manage the resources produced by others, either through exchanges of goods and services or through the threat of force. Human societies became multilayered as some groups began to specialize in the exploitation of other men and women, who exploited farmers, who exploited the natural environment. William McNeill has called these elite groups “macroparasites,” whereas the anthropologist Eric Wolf has called them “tribute takers.”

RELATIONS WITH NONAGRARIAN COMMUNITIES

Finally, the agrarian era was characterized by complex relations between agrarian communities and other types of communities. Throughout this era pastoralists and foragers living outside the main agricultural regions continued to have a significant impact on agrarian communities

by mediating exchanges between agrarian regions and sometimes by introducing technologies (such as the many technologies associated with pastoralism, from improved saddles to improved weaponry) or by trading valued goods such as furs or ivory or feathers.

Agrarian Communities before Cities: 8000–3000 BCE

The *early* agrarian era is that time when agrarian communities existed, but no large cities or states. In Afro-Eurasia this time extended from about 8000 BCE until about 3000 BCE, when the first cities emerged; in the Americas this time began later and lasted longer, and in parts of the Australasian and Pacific world zones it lasted until modern times.

A WORLD OF VILLAGES

During the early agrarian era villages were the largest communities on Earth and the most important sources of demographic and technological dynamism. In today's world, in which villages are marginal demographically, technically, culturally, and politically, we could all too easily forget the crucial historical role that villages played for many millennia. During the early agrarian era most villages practiced forms of agriculture that anthropologists might refer to as "horticulture" because they depended mainly on the labor of humans (and particularly of women, if modern analogies can be relied on), whereas their main agricultural implements were digging sticks of many kinds. However, these communities also pioneered important innovations such as irrigation and terracing, which eventually allowed the appearance of more populous communities. Thus, villages accounted for much of the demographic and geographical expansion of the agrarian world through many thousands of years.

EMERGENCE OF HIERARCHY

Within the villages of the early agrarian era men and women first encountered the revolutionary challenges posed by the emergence of larger, denser, and more hierarchical communities. As communities became larger,



people had to find new ways of defining their relationships with neighbors, determining who had access to stored resources, administering justice, and organizing warfare, trade, and religious worship. As specialization spread, communities had to find ways of regulating exchanges and conflicts between persons whose interests and needs were increasingly diverse. The simple kinship rules that had provided all the regulation necessary in small foraging communities now had to be supplemented with more elaborate rules regulating behavior between people whose contacts were more anonymous, more fleeting, and less personal. Projects involving entire communities, such as building temples, building canals, and waging warfare, also required new types of leadership.

The archaeological evidence shows how these pressures, all linked to the growing size of human communities, led to the creation of institutionalized political and economic hierarchies, with wealthy rulers, priests, and merchants at one pole and propertyless slaves or vagrants at the other pole. Archaeologists suspect the presence of institutionalized hierarchies wherever burials or residences begin to vary greatly in size within a community. Where children were buried with exceptional extravagance, we can be pretty sure that emerging hierarchies were hereditary, so parents could pass their status on to

The agrarian era was marked by more permanent settlements and accompanying graveyards. This photo is of the remains of a stone burial mound in Scotland.

their children. Where monumental structures appeared, such as the statues on Easter Island in the Pacific Ocean or giant stone circles such as Stonehenge in Britain, we can be certain that leaders existed with enough power to organize and coordinate the labor of hundreds or thousands of persons.

EARLY GLASS CEILING

Gender hierarchies may have been among the earliest forms of institutionalized hierarchies. As members of households established more complex relationships with outsiders, they came under the influence of new rules, structures, and expectations. An emerging division of labor also created new opportunities outside the household and the village. Yet, in a world where the economic and social success of each household depended on bearing and rearing as many children as possible, women usually had fewer opportunities to take on more specialized roles—some of which brought great wealth and power. The linguist and archaeologist Elizabeth Barber has argued that this fact may explain why men were more likely to occupy high-ranking positions in emerging hierarchies. Warfare may also have changed gender relations as population growth intensified competition between communities and as men began to monopolize the organization of violence.

Whatever the cause, the disproportionate presence of men in external power structures reshaped relations and attitudes within the village and the household. Men began to claim a natural superiority based on their role in emerging power structures outside the household, and women were increasingly defined by their role within the household and their relationships to men. Even the many women who earned money outside the household usually did so in jobs associated with the tasks of the household. Within the household the demands of peasant life ensured that men and women continued to work in partnership. At this intimate, domestic scale relationships owed as much to personal qualities as to gender. However, beyond the household the powerful web of cultural expectations and power relations now known as “patriarchy” emerged.



LEADERS AND LEADERSHIP

Hierarchies of power shaped many other relationships as local communities were drawn into wider networks of exchange. In these larger networks traditional kinship thinking no longer worked. Genealogies began to take on semifictional forms that allowed entire communities to claim descent from the same, often mythical ancestor. Such genealogies could generate new forms of hierarchy by ranking descent groups according to their exact relationship to the founder. Where descendants of senior lines claimed higher status, aristocracies began to appear. However, when people chose leaders, ability usually counted for as much as birth. Where high-born people lacked leadership skills, persons with more talent as conciliators, warriors, or mediators with the gods were chosen to support or replace them. Most simple forms of leadership derived from the needs of the community; thus, they depended largely on popular consent. This consent made early power structures fragile because the power of leaders could evaporate all too easily if they failed in the tasks for which they were chosen.

However, as communities expanded, the resources available to their leaders increased until leaders began to set aside a share of those resources to support specialist enforcers or rudimentary armies. In this way leaders whose power originated in the collective needs of their subjects eventually acquired the ability to coerce at least some of those they ruled and to back up the collection of resources and the control of labor with the threat of force. The details of such processes are largely hidden from us, although archaeological evidence and anthropological research can give us many hints of how some of these processes played out in particular communities. These processes prepared the way for the more powerful political structures that we know as “states.” States appeared in

**A carving of Kaban-Puuc,
the ancient Mayan god of
maize (corn) and rain.**

parallel with the large, sedentary communities we know as “cities.”

**The Earliest Cities and
States: 3000 BCE–500 BCE**

For those people who define history as “the study of the past through written records,” the period from 3000 BCE to 500 BCE was when history truly began because this was when the first written documents appeared in the two largest world zones: Afro-Eurasia and the Americas. From the perspective of world history this period marked a new stage in the complexity and size of human communities. In Afro-Eurasia, the largest and most populous of all world zones, the first cities and states appeared about 3000 BCE. In the Americas they appeared more than two thousand years later, in Mesoamerica and Peru. In the Australasian zone neither cities nor states appeared during the agrarian era; but in the Pacific zone embryonic states emerged on islands such as Tonga or Hawaii within the last thousand years.

If a single process accounts for the emergence of the first cities and states, it is increasing population density. The earliest cities and states appeared where people were most closely packed together, often because of the rapid expansion of irrigation agriculture. Sudden increases in population density intensified all the problems of coordination and control posed by large communities and

For more on these topics, please see the following articles:

- Andean States p. 86 (v1)
 - Babylon p. 229 (v1)
 - China p. 332 (v1)
 - Egypt, Ancient p. 629 (v2)
 - Harappan State and Indus Civilization p. 889 (v3)
 - Mesoamerica p. 1230 (v3)
 - Mesopotamia p. 1235 (v3)
 - Pacific, Settlement of p. 1406 (v4)
 - Sumerian Society p. 1796 (v4)
 - Trading Patterns, Ancient American p. 1848 (v5)
 - Trading Patterns, Ancient European p. 1852 (v5)
 - Trading Patterns, Mesoamerican p. 1874 (v5)
 - Writing Systems and Materials p. 2095 (v5)
-



greatly increased the need for specialist leaders. Rapid growth also multiplied the resources available to leaders. Thus, by and large the earliest cities appeared at about the same time as the earliest states. Cities can be defined as “large communities with a complex internal division of labor.” (In contrast, villages, and even some early towns, such as the town of Catalhuyuk in Turkey, which dates from 6000 BCE, normally consisted of roughly similar households, mostly engaged in agriculture, with limited hierarchies of wealth and little specialization of labor.) States can be defined as “power structures that rest on systematic and institutionalized coercion as well as on popular consent.”

Cities and states appeared as part of a larger cluster of social innovations, all of which were linked to the increasing scale and complexity of human societies in regions of highly productive agriculture. These innovations included the organization of specialized groups of officials and soldiers, writing, coercive forms of taxation, and monumental architecture.

AFRO-EURASIA AND THE AMERICAS

Because such an intimate connection existed between agricultural intensification and the appearance of cities and states, we should not be surprised that the earliest evidence for cities and states comes from regions with ancient agricultural traditions. The earliest clear evidence for communities large enough to be called “cities” and powerful enough to be called “states” comes from the ancient corridor from Sudan to Mesopotamia that links Africa and Eurasia. Some of the earliest states appeared

Documenting a Neolithic Settlement in the Electronic Age

Since 1993, an international team of archaeologists has been excavating the ancient city of Catalhoyuk in present-day Turkey, resuming an effort first begun in the 1960s. In an effort to bring alive the 9,000-year-old artifacts being found at the Catalhoyuk “dig,” team member Rebecca Daly maintains a weblog (blog) on the excavation website. Below is her entry for 28 July 2004.

Bleda is beginning the burial that was next to the sheep today, which thrills both of us, because we both suspect that there is some incredible stuff in that burial. There are a lot of burials coming out now, the human remains lab are tearing their hair out trying to get everything done. Just when they think they're going to catch up, more things appear! Sure enough, Bleda has come up with an interesting bird bone thing that both he and Lori, who's from the human

remains lab doing the burial, think is a flute. It's certainly the right shape, and it has had both of the ends knocked off which suggests they wanted to use the inside for something. I have high hopes, Bleda seems to attract the interesting objects. It would be really amazing if this is actually a flute of some sort, it would be the earliest musical instrument. The burial was sprinkled with ochre both under and over it, which suggests that it was a really important part of the burial process in this case. This was obviously a very significant burial anyway, what with the whole lamb, but this makes it even more so—there is some suggestion of the order in which the burial activities took place.

Source: Mysteries of Catalhoyuk. (2004). Retrieved September 8, 2004, from <http://lcs.mmm.org/catal/updates/>

during the centuries before 3000 BCE in southern Mesopotamia in the region known to archaeologists as “Sumer” and also along the Nile River in modern Egypt and Sudan. During the next thousand years evidence of cities and states appeared also in the Indus River valley in modern Pakistan and in northern China.

In the Americas we can trace a similar pattern of evolution from villages toward cities and states, but the earliest evidence for both changes came much later. Although large communities and powerful leaders existed in Mesoamerica in the lands of the Olmecs (in Mexico's southern gulf coast) by the second millennium BCE, most archaeologists would argue that the first true cities and states in the Americas appeared late during the first millennium BCE, in regions such as the Oaxaca Valley or farther south in the heartland of Mayan civilization. In the Andes, too, state-like communities, such as the Moche culture, appeared at the end of the first millennium BCE.

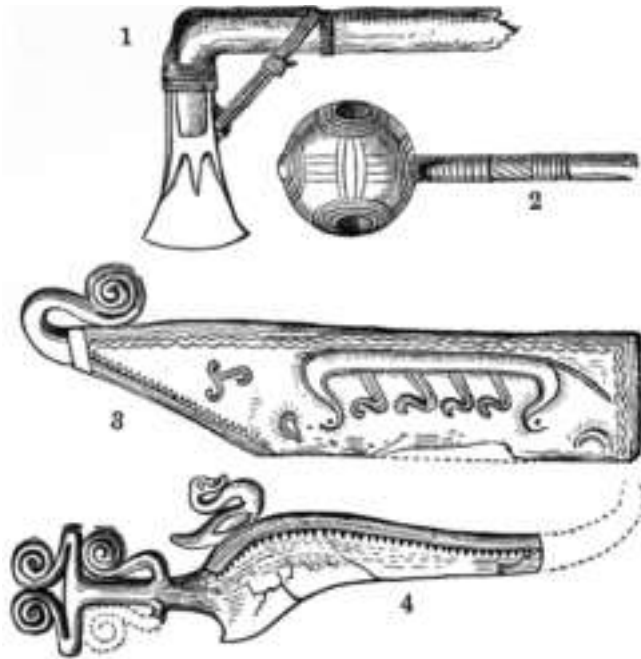
AGRARIAN CIVILIZATIONS

From these and other core areas the traditions of early statehood spread to adjacent regions as populations expanded and networks of material and cultural exchanges knit larger regions together, generating greater

concentrations of wealth and power. As they spread, states carried with them a core set of institutions and practices associated with what are often called “agrarian civilizations.” Directly or indirectly, the spread of agrarian civilizations reflected the increasing scale and density of human populations. Cities were simply the most concentrated and largest of all human communities. States were the large, coercive power structures that were necessary to administer and defend city-scale communities, and they were funded by the large concentrations of wealth found in cities and their hinterlands.

Collecting that wealth by force often began with crude forms of looting that eventually turned into the more formalized looting that we call “taxation.” Managing large stores of wealth required new forms of administration and new forms of accounting; indeed, in all emerging states writing apparently emerged first as a technique to keep track of large stores of wealth and resources. Even in the Inca state, where no fully developed system of writing emerged, rulers used a system of accounting based on intricately knotted strings (quipu).

Defending large concentrations of wealth and maintaining order within and between cities and city-states (autonomous states consisting of a city and surrounding



This drawing shows four progressively more intricate European bronze implements: (1) a hand axe with wooden handle; (2) decorated hair pin; (3) razor knife blade; and (4) curved knife blade.

in transportation and communications, such as the appearance of wheeled vehicles in Afro-Eurasia during the second millennium BCE, extended the reach of states, their officials, and their armies.

However, their influence reached much further than their power, as traders bridged the gaps between states, creating large networks of commercial and cultural exchange. Indeed, some experts have claimed that as early as 2000 BCE exchanges along the Silk Roads connecting China and the Mediterranean had already created a single, Eurasiawide system of exchanges.

As impressive as these large and powerful communities were, we should remember the limits of their power and influence. Few agrarian states took much interest in the lives of their citizens as long as they paid taxes. Maintaining law and order outside of the major cities was usually left to local power brokers of various kinds. Huge regions also lay beyond the direct control of imperial rulers. The scholar Rein Taagepera has estimated that early during the first millennium BCE states still controlled no more than about 2 percent of the area controlled by states today. Beyond this tiny area, which probably included most of the world's population, smaller communities of foragers, independent farmers, and pastoralists existed.

Although agrarian civilizations usually regarded these outside communities as barbarians, they could play a crucial role in providing sources of innovation and in linking agrarian civilizations. For example, steppe pastoralists in Eurasia transported religious ideas, metallurgical traditions, and even goods between China, India, and the Mediterranean world, and they may also have pioneered some of the military and transportation technologies of agrarian civilizations, such as the wheeled chariot. The most innovative naval technologies of this period were found in the western Pacific, where peoples of the Lapita culture, using huge double-hulled canoes, settled a vast area from New Guinea to Fiji and Tonga between 3000 and 1000 BCE.

Long-term growth in the number, size, and power of cities and states reflected not only innovations in statecraft and warfare, but also the sustained demographic

territory) required the creation of armies. In Sumer and elsewhere invading armies possibly established the first states, and certainly all early states engaged enthusiastically in warfare. The rulers of the earliest states also engaged in symbolic activities that were equally vital to the maintenance of their power. They organized extravagant displays of wealth, often involving human sacrifices, and built palaces, temples, and monuments to the dead, often in the form of pyramids or ziggurats (temple towers consisting of a lofty pyramidal structure built in successive stages with outside staircases and a shrine at the top). These elaborate structures were designed to raise the prestige of local rulers and of the cities they ruled and the gods they worshiped.

IMPERIAL STATES

Through time the scale of state systems expanded as city-states traded with and sometimes absorbed other city-states. Eventually imperial systems emerged in which a single ruler controlled a large region of many cities and towns. Sargon of Akkad (reigned c. 2334–2279 BCE) may have established the first imperial state, in Mesopotamia, north of Sumer. By the middle of the second millennium BCE the Shang dynasty (approximately 1766–1045 BCE) had created an imperial state in northern China. Through time such states became more common. As states expanded, they taxed and administered larger areas, either directly or indirectly through local rulers. Improvements



buoyancy of the entire agrarian era. Our figures are too vague to allow much precision, but clearly, at least in the long trend, populations grew faster in areas of agriculture than elsewhere. However, they probably did not grow much faster than during the early agrarian era. Particularly in the cities, with their appalling sanitary conditions, bad air, and filthy water, death rates were extraordinarily high. Although cities offered more opportunities, they also killed people far more effectively than the villages. Population growth was also slowed by periodic demographic collapses. The spread of diseases into regions whose populations lacked immunities may have caused some of these collapses; overexploitation of the land, which could undermine the productive basis of entire civilizations, may have caused others. In southern Mesopotamia toward the end of the second millennium, populations fell sharply, probably as a result of overirrigation, which created soils too salty to be farmed productively. Archaeologists can trace the progress of salinization late during the second millennium through the increasing use of barley, a more salt-tolerant grain than wheat.

Agriculture, Cities, and Empires: 500 BCE–1000 CE

Most of the long trends that began after 3000 BCE continued during the period from 500 BCE to 1000 CE. Global populations rose (although they did so slowly during the middle of this period), the power, size, and number of states increased, and so did the extent of exchange networks. As agriculture spread, cities and states appeared in once-peripheral regions in northwestern Europe, sub-Saharan Africa, southern India, and southern China. Increasingly, agrarian civilizations encroached on regions inhabited by foragers, independent peasants, and pastoralists. Similar processes occurred in the Americas but with a time lag of approximately two thousand years.

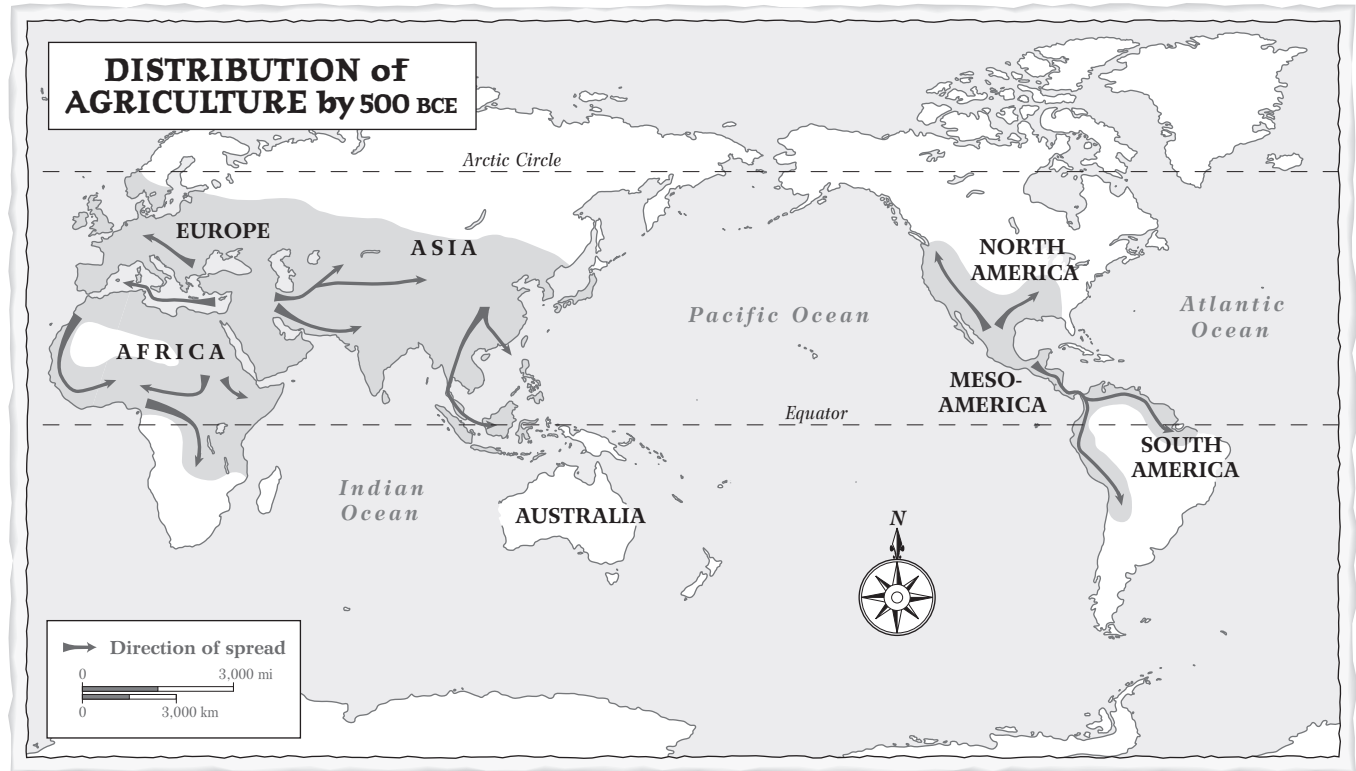
AFRO-EURASIA

The Achaemenid empire, created in Persia (modern Iran) during the sixth century BCE, marked a significant enhancement in state power because the empire controlled

For more on these topics, please see the following articles:

- Andean States p. 86 (v1)
 - Assyrian Empire p. 200 (v1)
 - Buddhism p. 267 (v1)
 - Byzantine Empire p. 278 (v1)
 - Catholicism, Roman p. 310 (v1)
 - China p. 332 (v1)
 - Confucianism p. 426 (v1)
 - Greece, Ancient p. 858 (v3)
 - Hinduism p. 902 (v3)
 - Islam p. 1024 (v3)
 - Judaism p. 1058 (v3)
 - Manichaeism p. 1179 (v3)
 - Mesoamerica p. 1230 (v3)
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 - Persian Empire p. 1462 (v4)
 - Roman Empire p. 1624 (v4)
 - State, The p. 1776 (v4)
 - Steppe Confederations p. 1782 (v4)
 - Trading Patterns, China Seas p. 1855 (v5)
 - Trading Patterns, Indian Ocean p. 1864 (v5)
 - Trading Patterns, Mediterranean p. 1870 (v5)
 - Trading Patterns, Pacific p. 1879 (v5)
 - Trading Patterns, Trans-Saharan p. 1883 (v5)
 - Turkic Empire p. 1905 (v5)
 - Zoroastrianism p. 2120 (v5)
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a region five times as large as the greatest of its predecessors. During the next fifteen hundred years empires on this scale became the norm. They included the Han dynasty in China (206 BCE–220 CE), the Roman empire in the Mediterranean (27 BCE–476 CE), and the Mauryan empire (c. 324–c. 200 BCE) in India. The Muslim Abbasid empire, which ruled much of Persia and Mesopotamia from 749/750 to 1258, controlled a slightly larger area than its Achaemenid predecessors. Contacts also flourished between imperial states. During the sixth century BCE Cyrus I, the founder of the Achaemenid empire, invaded parts of modern central Asia. When the Chinese emperor, Han Wudi, invaded the same region three centuries later, the separate agrarian civilizations of the Mediterranean world and eastern Asia came into closer



contact than ever before, binding the whole of Eurasia into the largest system of exchange on Earth.

The increased reach of political, commercial, and intellectual exchange networks may explain another important development during this era: the emergence of religious traditions that also extended over huge areas—the first world religions. Whereas earlier religious traditions usually claimed the allegiance of particular communities or regions, world religions claimed to express universal truths and to represent universal gods—reflections, perhaps, of the increasing scale of imperial states.

The first world religion was probably Zoroastrianism, a religion whose founder may have come from central Asia during the sixth century BCE, at about the time when Cyrus I founded the Achaemenid empire. Buddhism was founded soon after in northern India during a period of rapid urbanization and state expansion. Its great period of expansion came early during the first millennium CE, when it began to spread in central Asia, China, and southeastern Asia. The influence of Christianity expanded within the Roman empire until, during the fourth century CE, it became the official religion of the state. Both Buddhism and Christianity spread into central Asia and eventually reached China, although of the two only Buddhism made a significant impact on Chinese civilization.

Even more successful was Islam, founded in southwestern Asia during the seventh century. Islam spread into north Africa, central Asia, India, and southeastern Asia, carried first by armies of conquest and later by the Muslim missionaries and holy men known as “sufis.”

The same forces that gave rise to the first world religions may also have spurred some of the first attempts at universal generalizations about reality in embryonic forms of philosophy and science. Although normally associated with the philosophical and scientific traditions of classical Greece, such ideas can also be found within the astronomical and mathematical traditions of Mesopotamia and the philosophical traditions of northern India and China.

THE AMERICAS

In the Americas, too, political systems expanded in size, in military power, and in cultural and commercial reach. During the first millennium CE complex systems of city-states and early empires emerged in Mesoamerica. At its height the great city of Teotihuacan in Mexico had a population of more than 100,000 people and controlled trade networks reaching across much of Mesoamerica. However, we cannot be certain that it had direct control of any other cities or states. Farther south, Mayan civiliza-

A sixteenth-century Native American agricultural village as depicted by early English settlers in Virginia.

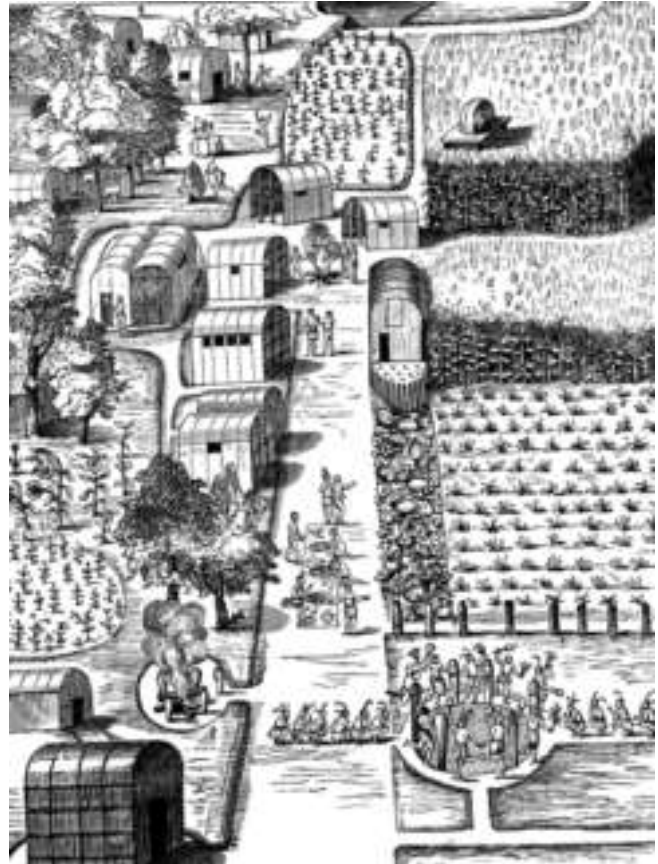
tion consisted of a large number of regional states, some of which may have established at least temporary control over their neighbors. Both these powerful systems collapsed, however, during the second half of the first millennium CE. As in southern Mesopotamia early during the second millennium BCE, the collapse may have been caused by overexploitation of the land.

However, just as the political traditions of Sumer were eventually taken up in Babylon and Assyria, so, too, in Mesoamerica the political traditions of Teotihuacan and the Maya provided the cultural foundations for even more powerful states during the next period of the agrarian era. In the Andes, too, cities and states began to appear; the first may have been the Moche state of northern Peru, which flourished for almost eight hundred years during the first millennium CE. Like Teotihuacan, the Moche kingdom influenced a large area, although we cannot be certain how much direct political power it had over other cities and states. During the later half of the first millennium statelike powers also emerged farther south in the lands near Lake Titicaca in South America.

EXPANSION IN OTHER AREAS

Populations also grew beyond the zone of agrarian civilization, generating new forms of hierarchy. In the thinly populated steppe zones of Eurasia, pastoral nomads began to form large, mobile confederations that raided and taxed neighboring agricultural zones. In Mongolia in central Asia the Xiongnu people created spectacular empires during the second century BCE, as did the founders of the first Turkic empire during the sixth century CE. At its height the first Turkic empire reached from Mongolia to the Black Sea. In the Pacific zone migrants from the islands near Fiji began to settle the islands of Polynesia, scattered through the central and eastern Pacific. Hawaii and remote Easter Island may have been settled by 600 CE, but New Zealand seems to have been the last part of Polynesia to be settled, some time after 1000. Polynesia was settled by farming peoples, and in some regions, including Tonga and Hawaii, population growth created the preconditions for significant power hierarchies.

Finally, significant changes occurred even in regions



where agriculture had still made few inroads. In North America the slow northward spread of maize cultivation led to the establishment of numerous agricultural or semiagricultural communities, such as those known as the “Anasazi” (on the Colorado Plateau at the intersection of present-day Arizona, New Mexico, Colorado, and Utah). In the eastern parts of North America, too, farming communities emerged in regions such as the Ohio River valley, where they cultivated local plants such as sunflowers. Even in Australia foraging communities intensified production and settled in denser communities, particularly along the coasts.

Agricultural Societies on the Eve of the Modern Revolution: 1000–1750

During the last period of the agrarian era, from 1000 to 1750, earlier trends continued, but fundamental changes also prefigured the modern era.

Agriculture spread into previously marginal regions such as North America, southern Africa, and western China. Often migrant farmers settled new lands with the

The perfect knowledge of history is extremely necessary; because, as it informs us of what was done by other people, in former ages, it instructs us what to do in the like cases. Besides, as it is the common subject of conversation, it is a shame to be ignorant of it. • LORD CHESTERFIELD (1694–1773)

active support of metropolitan merchants or governments. World populations continued to grow, despite sharp declines in much of Eurasia after the Black Death (bubonic plague) of the fourteenth century and in the Americas during the sixteenth century after the arrival of Afro-Eurasian diseases such as smallpox. The sixteenth-century economic and demographic collapse in the Americas was offset in the long run by the arrival of immigrants, livestock, and new crops from Eurasia and the subsequent expansion of land under cultivation. In agriculture, weaponry, transportation (particularly seaborne transportation), and industry, a steady trickle of innovations sustained growth by gently raising average productivity and enhancing state power. The economist Angus Maddison has estimated that global gross domestic product (GDP, the total production of goods and services)

For more on these topics, please see the following articles:

Aztec Empire p. 221 (v1)
 Biological Exchanges p. 249 (v1)
 China p. 332 (v1)
 Columbian Exchange p. 386 (v1)
 Crusades, The p. 453 (v1)
 Diseases—Overview p. 543 (v2)
 Diseases, Animal p. 551 (v2)
 Economic Growth, Extensive and Intensive p. 610 (v2)
 Expansion, European p. 700 (v2)
 Exploration, Chinese p. 712 (v2)
 Firearms p. 750 (v2)
 Inca Empire p. 958 (v3)
 Islamic World p. 1036 (v3)
 Labor Systems, Coercive p. 1094 (v3)
 Maritime History p. 1188 (v3)
 Mongol Empire p. 1295 (v3)
 Navigation p. 1363 (v4)
 Ottoman Empire p. 1401 (v4)
 Population p. 1484 (v4)
 Slave Trades p. 1717 (v4)
 Technology—Overview p. 1806 (v5)
 Trading Patterns, Mesoamerican p. 1874 (v5)
 Viking Society p. 1936 (v5)
 War and Peace—Overview p. 1943 (v5)

rose from approximately \$120 billion (in 1990 international dollars) in 1000 to almost \$700 billion in 1820.

CREATION OF GLOBAL NETWORKS

The most important change during this era was the unification of the major world zones during the sixteenth century. This unification created the first global networks of exchanges. The linking of regions that previously had no contact for many thousands of years generated a commercial and intellectual synergy that was to play a critical role in the emergence of the modern world.

In Afro-Eurasia the most striking feature of the early part of the last millennium was the increasing scale and intensity of international contacts. Viking raiders and traders traveled in central Asia, in the Mediterranean, along the coast of western Europe, even in distant Iceland and Greenland, and in 1000 they even created a short-lived colony in Newfoundland, Canada. The astonishing conquests of the Mongols early during the thirteenth century created a huge zone of relative peace extending from Manchuria to the Mediterranean, and, with Mongol protection, the trade routes of the Silk Roads flourished during the late thirteenth and early fourteenth centuries. Sea routes were equally active, and exchanges of goods by sea from the Mediterranean through southern and southeastern Asia to China became routine. Briefly during the early fifteenth century Chinese fleets made a series of expeditions to the West, some of which took them to Arabia in southwestern Asia and east Africa.

Control of the Eurasian heartlands of Persia and central Asia—first by the Muslim empire of the Abbasids late during the first millennium and then by the Mongols—encouraged the exchange of technologies, goods, and religious and cultural traditions throughout Eurasia. In the Americas the first imperial states appeared. The most successful and best known were those of the Aztecs, based at Tenochtitlan in Mexico, and of the Incas, based at Cuzco in Peru. These were the first American polities (political organizations) to exert direct political and military control over very large areas.

However, the small, highly commercialized states of western Europe, not imperial states, eventually linked the



A display of burial goods recovered from the burial mounds of agrarian era farmers in southeastern Missouri.



separate world zones of the agrarian era. The first significant states had emerged in western Europe during the first millennium CE as the region had been absorbed within the commercial and cultural hinterland of the Roman empire. Early during the ninth century the first holy Roman emperor, Charlemagne, tried to create a revived Roman empire from a base on the border between modern France and Germany. His failure helps explain why Europe emerged as a region of competing medium-sized states. Because such states had a more limited tax base than great imperial powers such as the Abbasid empire or China's Tang (618–907 CE) empire, they had to seek alternative sources of revenue, including revenues from trade, to survive the vicious warfare that became the norm in this region.

Not surprisingly, a tradition of predatory, militaristic trading states emerged, epitomized by the Vikings. Blocked in the eastern Mediterranean, European powers sought new ways of cutting into the great markets of southern and eastern Asia, and this search, backed aggressively by European governments, eventually encouraged European merchants, led by the Portuguese, to circle the globe. This search also encouraged the technological innovations needed to create ships capable of navigating the world. The wealth that European states secured as they cut in on the profits of the great trading systems of southeastern Asia and the even more spectacular gains they made by conquering the great civilizations of Central and South America repaid the initial investment of money and resources many times over.

IMPACT OF GLOBAL NETWORKS

The Americas and Europe were the first regions to be transformed by the new global system of exchanges. In eastern Eurasia the incursions of Europeans had a limited impact for a century or more. Portuguese and Spanish ships, followed a century later by Dutch and English ships, seized important trading ports and began to cut in on local trade, particularly in spices. However, they had little impact on the major polities of the region. In the Americas European weaponry, the breakdown of traditional political and economic structures, and, perhaps

most important of all, the impact of Eurasian pathogens such as smallpox crippled the Aztec and Inca empires and secured for the Spanish government an astonishing windfall of trade goods and precious metals that funded the first empire to straddle the Atlantic Ocean. European diseases were particularly destructive in the Americas because most natives lacked immunity to the diseases that had spread through Afro-Eurasia through many centuries. Estimates of the population decline during the sixteenth century in the most densely populated regions of the Americas range from 50 percent to almost 90 percent.

Control of global trade networks brought European states great commercial wealth, but it also brought an influx of new information about geography, the natural world, and the customs of other societies. The torrent of new information available to European intellectuals may have played a critical role in undermining traditional certainties and creating the skeptical, experimental cast of mind that we associate with the so-called scientific revolution.

However, no region on Earth was entirely unaffected by the creation of the first global system of exchanges. The exchange of goods between the Americas and Afro-Eurasia stimulated population growth throughout Afro-Eurasia as crops such as maize, cassava, and potatoes spread to China, Europe, and Africa, where they supplemented existing crops or allowed people to cultivate lands unsuitable for other crops. The abundant silver of the Americas gave a huge boost to international trade, particularly after Chinese governments began to demand the payment of taxes in silver from the 1570s, pulling more and more silver toward what was still the largest single economy in the world. New drugs such as tobacco and coca became available for the first time to Afro-Eurasian consumers, whereas older drugs, such as coffee, circulated more widely, stimulating consumer demand in cities from Istanbul to Mexico City.

Perhaps most important of all, the position of Europe within global networks of exchange was transformed. As long as the world was divided into separate zones, Europe could be little more than a marginal borderland of Afro-Eurasia. The hub of Eurasian networks of exchange lay in the Islamic heartland of Persia and Meso-

History, n. An account, mostly false, of events, mostly unimportant, which are brought about by rulers, mostly knaves, and soldiers, mostly fools. • AMBROSE BIERCE (1842–1914)

potamia. In the integrated world system that emerged during the sixteenth century, European states found themselves at the hub of the largest and most vigorous exchange networks that had ever existed. The huge flows of wealth and information that coursed through these networks would transform the role and significance of Europe and the Atlantic region in world history, and eventually they would transform the entire world.

Agrarian Era in World History

The introduction of agricultural technologies raised productivity, increased populations, and stimulated innovation. These developments explain why change was so much more rapid during the agrarian era than during the era of foragers. Larger, denser communities created new problems that were solved by forming the large, hierarchical structures that we call “states,” “empires,” and “civilizations.” Within these structures the very nature of human communities was transformed as families and households found themselves incorporated in, and disciplined by states, religions, and market forces. The exchange of technologies and goods between larger regions and larger populations stimulated many small improvements in agrarian techniques, communications technologies, and the technologies of information storage and warfare. However, although innovation was much faster than it had been during the era of foragers, it was rarely fast enough to keep pace with population growth, which is why, on the smaller scales that meant most to rulers and their subjects, the characteristic rhythm of change during the agrarian era was cyclical.

The modern world built on the slow accumulation of people, resources, and information that took place during the agrarian era, but it was marked out from this era by another sharp acceleration in rates of innovation that would lead to one more fundamental transformation in human lifeways.

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Our World: The Modern Era



The modern era is the briefest and most turbulent of the three main eras of human history. Whereas the era of foragers lasted more than 200,000 years and the agrarian era about 10,000 years, the modern era has lasted just 250 years. Yet, during this brief era change has been more rapid and more fundamental than ever before; indeed, populations have grown so fast that 20 percent of all humans may have lived during these two and a half centuries. The modern era is also the most interconnected of the three eras. Whereas new ideas and technologies once took thousands of years to circle the globe, today people from different continents can converse as easily as if they lived in a single global village. History has become world history in the most literal sense.

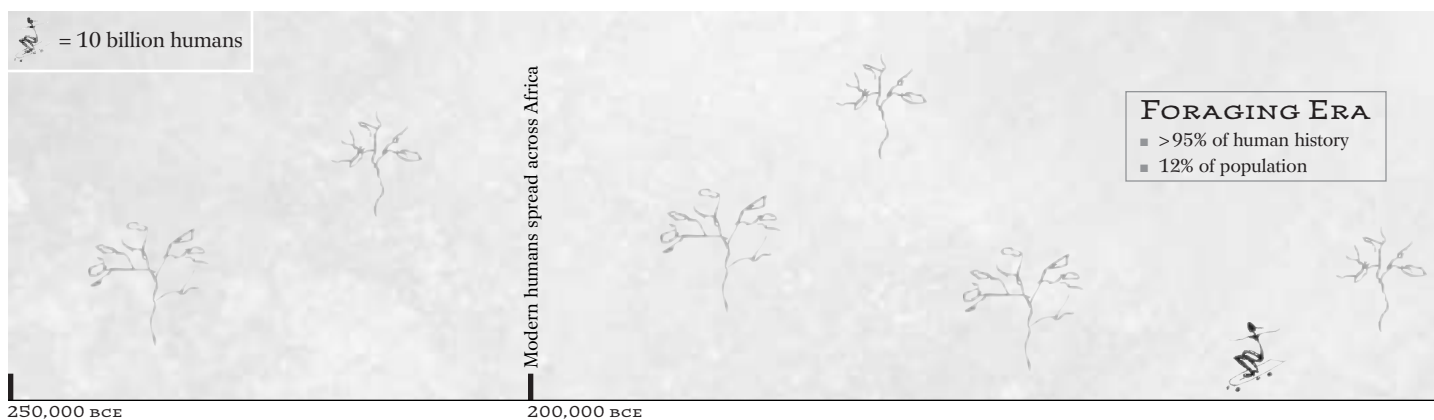
For our purposes the modern era is assumed to begin about 1750. Yet, its roots lay deep in the agrarian era, and we could make a good case for a starting date of 1500

or even earlier. Determining the end date of the modern era is even trickier. Some scholars have argued that it ended during the twentieth century and that we now live in a postmodern era. Yet, many features of the modern era persist today and will persist for some time into the future; thus, it makes more sense to see our contemporary period as part of the modern era. This fact means that we do not know when the modern era will end, nor can we see its overall shape as clearly as we might wish.

The fact that we cannot see the modern era as a whole makes it difficult to specify its main features, and justifies using the deliberately vague label “modern.” At present the diagnostic feature of the modern era seems to be a sharp increase in rates of innovation. New technologies enhanced human control over natural resources and stimulated rapid population growth. In their turn, technological and demographic changes transformed life-

250,000 Years of Human History

(NOT DRAWN TO SCALE)



ways, cultural and religious traditions, patterns of health and aging, and social and political relationships.

For world historians the modern era poses distinctive challenges. We are too close to see it clearly and objectively; we have so much information that we have difficulty distinguishing trends from details; and change has occurred faster than ever before and embraced all parts of the world. What follows is one attempt to construct a coherent overview, based on generalizations that have achieved broad acceptance among world historians.

Major Features and Trends of the Modern Era

The modern era is the first to have generated a large body of statistical evidence; thus, it is also the first in which we can quantify many of the larger changes.

INCREASES IN POPULATION AND PRODUCTIVITY

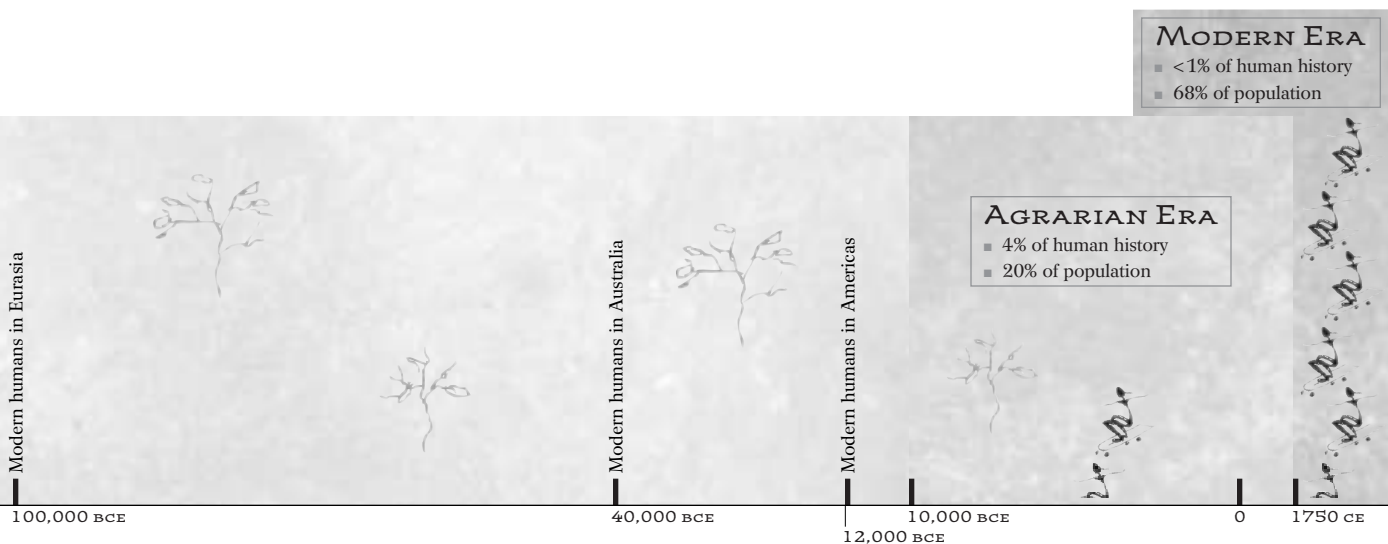
Human populations have increased faster than ever before during the modern era, although growth rates slowed during the late twentieth century. Between 1750 and 2000 the number of men and women in the world rose from approximately 770 million to almost 6 billion, close to an eightfold increase in just 250 years. This increase is the equivalent of a growth rate of about 0.8 percent per annum and represents a doubling time

Key Features and Trends of the Modern Era

- Rapid Population Growth
- Technological Innovation
- Large Increase in Productivity
- Harnessing of Fossil and other Forms of Energy
- Large Communities
- Bureaucracy
- Nationalism
- Longer Life Expectancy
- Broader Role for Women
- Commercialization
- Global Networks
- Destruction of Foraging and Agrarian Lifeways

of about eighty-five years. (Compare this with estimated doubling times of fourteen hundred years during the agrarian era and eight thousand to nine thousand years during the era of foragers.) An eightfold increase in human numbers was possible only because productivity rose even faster. The estimates of the economist Angus Maddison suggest that global gross domestic product rose more than ninetyfold during three hundred years, whereas production per person rose ninefold.

These astonishing increases in productivity lie behind



All history is necessarily written from the standpoint of the present, and is, in an inescapable sense, the history not only of the present but of that which is contemporaneously judged to be important in the present. • JOHN DEWEY (1859–1952)

For more on these topics, please see the following articles:

Colonialism p. 381 (v2)
 Democracy, Constitutional p. 508 (v2)
 Diasporas p. 521 (v2)
 Empire p. 640 (v2)
 Global Imperialism and Gender p. 838 (v2)
 Global Migration in Modern Times p. 844 (v3)
 Indigenous Peoples Movements p. 970 (v3)
 Industrial Technologies p. 981 (v3)
 Information Societies p. 985 (v3)
 Modernity p. 1287 (v3)
 Population p. 1484 (v4)
 Technology—Overview p. 1806 (v5)
 Urbanization p. 1925 (v5)
 Western Civilization p. 2041 (v5)
 Women's and Gender History p. 2046 (v5)
 World Cities in History—Overview p. 2066 (v5)
 World System Theory p. 2075 (v5)

all the most significant changes of the modern era. Productivity rose in part because new technologies were introduced. In agriculture, for example, food production kept pace with population growth because of improved crop rotations, increased use of irrigation, widespread application of artificial fertilizers and pesticides, and the use of genetically modified crops. However, productivity also rose because humans learned to exploit new sources of energy. During the agrarian era each human controlled, on average, 12,000 kilocalories a day (about four times the energy needed to sustain a human body), and the most powerful prime movers available were domestic animals or wind-driven ships. During the modern era humans have learned to harvest the huge reserves of energy stored in fossil fuels such as coal, oil, and natural gas and even to exploit the power lurking within atomic nuclei. Today each person controls, on average, 230,000 kilocalories a day—twenty times as much as during the agrarian era. A world of planes, rockets, and nuclear power has replaced a world of horses, oxen, and wood fires.

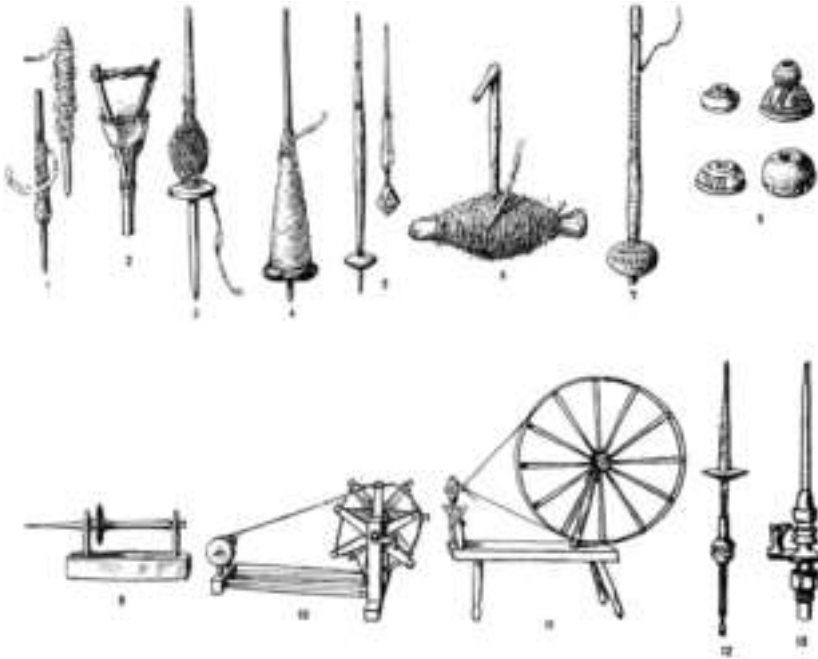
CITY SPRAWL

As populations have increased, so has the average size of human communities. In 1500 about fifty cities had more than 100,000 inhabitants, and none had more than a million. By 2000 several thousand cities had more than 100,000 inhabitants, about 411 had more than a million, and 41 had more than 5 million. During the agrarian era most people lived and worked in villages; by the end of the twentieth century almost 50 percent of the world's population lived in communities of at least five thousand people. The rapid decline of villages marked a fundamental transformation in the lives of most people on Earth. As during the agrarian era, the increasing size of communities transformed lifeways, beginning with patterns of employment: Whereas most people during the agrarian world were small farmers, today most people support themselves by wage work in a huge variety of occupations.

Innovations in transportation and communications have transformed relations between communities and regions. Before the nineteenth century no one traveled faster than the pace of a horse (or a fast sailing ship), and the fastest way to transmit written messages was by state-sponsored courier systems that used relays of horses. Today messages can cross the world instantaneously, and even perishable goods can be transported from one end of the world to another in just a few hours or days.

INCREASINGLY COMPLEX AND POWERFUL GOVERNMENTS

As populations have grown and people's lives have become more intertwined, more complex forms of regulation have become necessary, which is why the business of government has been revolutionized. Most premodern governments were content to manage war and taxes, leaving their subjects to get on with their livelihoods more or less unhindered, but the managerial tasks facing modern states are much more complex, and they have to spend more effort in mobilizing and regulating the lives of those they rule. The huge bureaucracies of modern states are one of the most important by-products of the modern



This plate shows a variety of tools of increasing technological complexity used by humans at different times and places to twist fiber. Spindles 1 and 2 are the simplest forms (other than human fingers) with fiber wound around a wooden peg. Spindles 3 through 7 are more complex, with a whorl added to the spindle. Spindle 9 marks the transition to modern spindles shown in 10 and 11 with flywheels.

revolution. So, too, are the structures of democracy, which allow governments to align their policies more closely with the needs and capabilities of the large and varied populations they rule. Nationalism—the close emotional and intellectual identification of citizens with their governments—is another by-product of these new relationships between governments and those they rule.

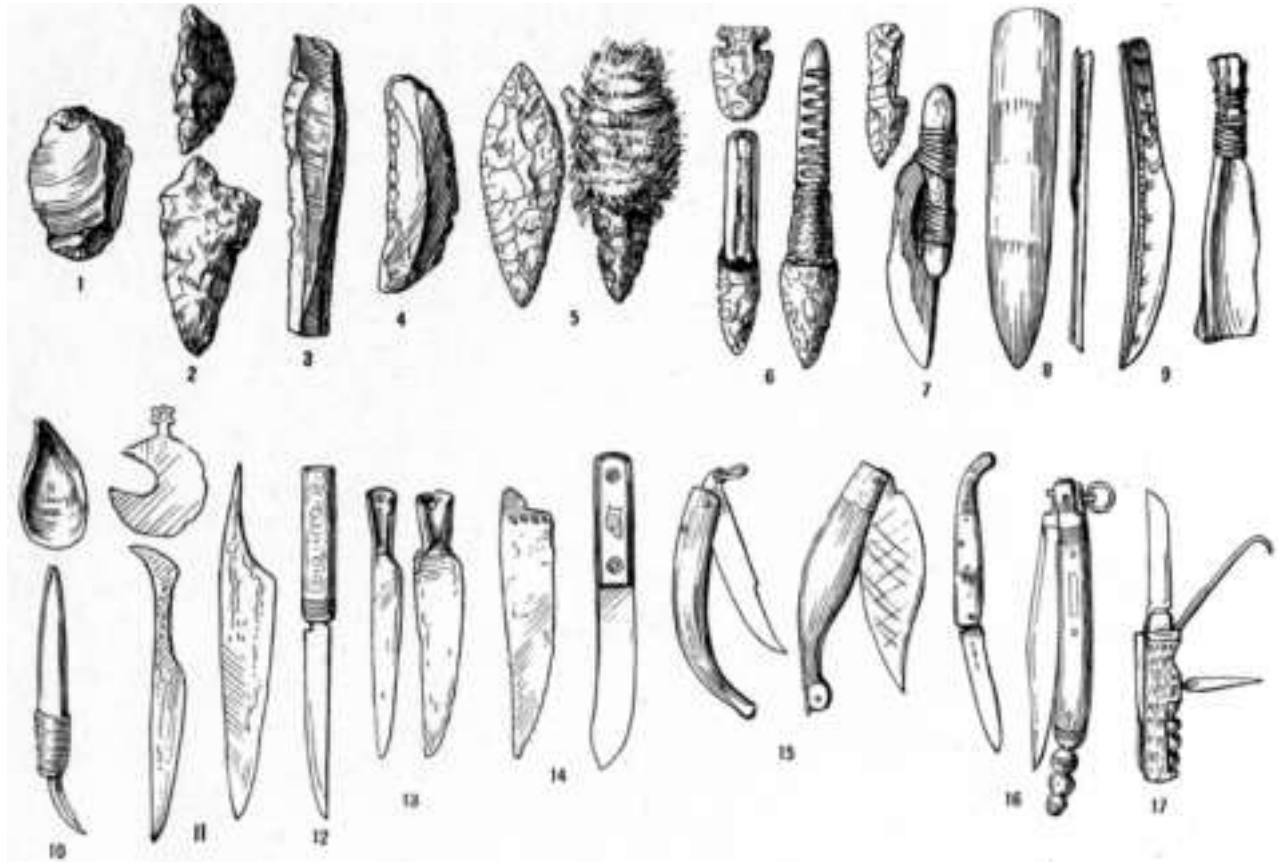
The presence of democracy and nationalism may suggest that modern governments are more reluctant to impose their will by force, but, in fact, they have much more administrative and coercive power than did rulers of the agrarian era. No government of the agrarian era tried to track the births, deaths, and incomes of all the people it ruled or to impose compulsory schooling; yet, many modern governments handle these colossal tasks routinely. Modern states can also inflict violence more effectively and on a larger scale than even the greatest empires of the agrarian era. Whereas an eighteenth-century cannon could destroy a house or kill a closely packed group of soldiers, modern nuclear weapons can destroy entire cities and millions of people, and the concerted launch of many nuclear weapons could end human history within just a few hours.

A subtler change in the nature of power is the increased dependence of modern states on commercial success rather than raw coercion. Their power depends so much on the economic productivity of the societies they

rule that modern governments have to be effective economic managers. The creation of more democratic systems of government, the declining importance of slavery, the ending of European imperial power during the twentieth century, the collapse of the Soviet command economy in 1991, and the ending of apartheid (racial segregation) in South Africa in 1990 and 1991 all reflected a growing awareness that successful economic management is more effective than crudely coercive forms of rule.

GROWING GAP BETWEEN RICH AND POOR

Although wealth has accumulated faster than ever before, the gap between rich and poor has widened, both within and between countries. The estimates of Angus Maddison suggest that in 1820 the GDP per person of the United States was about three times that of all African states; by 1998 the ratio had increased to almost twenty times that of all African states. Yet, some of the benefits of modern technologies have been shared more generally. Improvements in the production and supply of food and in sanitation, as well as improved understanding of diseases and the introduction of vaccinations (during the nineteenth century) and antibiotics (during the twentieth century) help explain why, for the first time in human history, so few people die in infancy or childhood that average life expectancies have more than doubled, rising from about



This interesting plate of knives shows the development of the hand knife used throughout human history for working wood. Knives 1 through 7 are all of stone, each one more carefully finished than earlier ones. Knives 8 through 10 show specialized use of bamboo, ivory, and clam shell. The remainder of the knives all have metal blades and show increasing sophistication with handles, hinges, springs, and several blades in one knife.

twenty-six years in 1820 to about sixty-six years at the end of the twentieth century. These gains have not been shared equally, but all parts of the world have felt their impact.

IMPROVED OPPORTUNITIES FOR WOMEN

Relations between men and women have been renegotiated in many parts of the world. New energy sources have reduced the importance of physical strength in employment, new forms of contraception have given women and men more control over reproduction, and new technologies, such as bottle feeding, have allowed parents to more easily share the task of caring for infants. Reduced infant mortality and new forms of socialized old-age support have reduced the pressure to have many children as

a form of old-age insurance. Finally, urbanization and commercialization have created more varied forms of employment for women as well as men. Women are less closely tied to their traditional role as child rearers, particularly in the most industrialized regions of the world. Nevertheless, gender inequality still survives even in those societies most deeply transformed by the modern revolution. Even in the United States and western Europe the average wages of women lag behind those of men.

DESTRUCTION OF PREMODERN LIFEWAYS

Finally, the modern revolution has destroyed premodern lifeways. Until the twentieth century independent communities of foragers survived in many parts of the world, but by the end of the twentieth century no foragers lived

UN Commemoration of the Abolition of Slave Trade

While acknowledging that slavery has existed since antiquity and continues to exist in modern form, the United Nations declared 2004 as International Year to Commemorate the Struggle against Slavery and its Abolition. Below are excerpts from a message delivered by Koichiro Matsuura, director-general of UNESCO (the United Nations Educational, Scientific and Cultural Organization), on 23 August 2004.

The celebration of 23 August, International Day for the Remembrance of the Slave Trade and its Abolition, has particular symbolic value this year, 2004, which was proclaimed International Year to Commemorate the Struggle against Slavery and its Abolition by the United Nations General Assembly. The purpose of the Year is to remind humanity of the fight of the slaves for freedom, justice and dignity, a fight that led to the independence of Haiti and the proclamation in 1804 of the first Black republic.

The date of 23 August refers to the insurrection that started in the night of 22 to 23 August 1791 on the island of Saint-Domingue (today divided between Haiti and the Dominican Republic), led by Toussaint Louverture, the first Black major general. The insurrection was to lead to the first decisive victory for slaves against their oppressors in the history of humanity.

On 23 August 2004, we are thus commemorating two key events: the revolt of 1791 and its culmination in 1804.

The Day gives us the opportunity to reflect together

on the historical causes, processes and consequences of the unprecedented tragedy that was slavery and the slave trade, a tragedy that was concealed for many years and is yet to be fully recognized.

It also provides us with an opportunity to understand more clearly the interactions that the slave trade generated throughout the world between the different peoples involved. It not only disrupted the lives of millions of human beings uprooted from their land and deported in the most inhuman conditions, but it brought about cultural exchanges which deeply and lastingly influenced morals and beliefs, social relations and knowledge on several continents.

[...]

Beyond these retrospective dimensions, the Day aims to sensitize and alert public opinion to the new trade in human beings, for slavery, although abolished and penalized in international instruments, is still practised in new forms, that today affect millions of men, women and children across the world.

I therefore call on the whole population in all Member States, in particular intellectuals, political, religious and community leaders, educators, artists and young people, to mark the Day with acts of meditation, awareness-raising and exchange about the tragedy of slavery that we cannot forget, and that we can never again tolerate.

Source: Message of the director-general of UNESCO. (August 23, 2004). Retrieved September 8, 2004, from http://portal.unesco.org/culture/en/ev.php-URL_ID=22385&URL_DO=DO_TOPIC&URL_SECTION=201.html

outside a modern state, and their lifeways had been transformed as they had been forcibly brought into the modern world. Peasant farming—the lifeway of most women and men throughout the agrarian era—declined as peasant households were unable to compete with large, industrial agribusinesses or the commercial farmers of more industrialized countries. By the end of the twentieth century peasant farming had vanished in much of the world. Even where it survived—in much of east Asia and Africa, for example, as well as in much of Latin America—it was in decline. These changes marked the

end of traditions, cultures, and lifeways that had shaped the lives of most humans throughout the earlier eras of human history.

Explaining the Modern Revolution

The key to these momentous changes was a sudden rise in the productivity of human labor caused by increasing rates of innovation. So, to explain modernity we must explain why rates of innovation have risen so fast during the modern era. As yet no general agreement exists on the



A modern Chinese market in Beijing combines the traditional market with many modern features.

causes of the modern revolution or, indeed, on the general causes of innovation in human history. However, widespread agreement exists on some of the more important contributing factors.

ACCUMULATED CHANGES OF THE AGRARIAN ERA

First, the modern revolution clearly built on the accumulated changes of the agrarian era. Slow growth during several millennia had led to incremental technological improvements in agriculture and water management, in warfare, in mining, in metalwork, and in transportation and communications. Improvements in transportation and communications—such as the development of more maneuverable ships or the ability to print with movable type—were particularly important because they increased the scale of exchanges and ensured that new technologies, goods, and ideas circulated more freely. Methods of organizing large numbers of humans for warfare or tax collection also improved during the agrarian era. In ways that are not yet entirely clear, these slow technological and organizational changes, together with a steady expansion in the size and scale of global markets, created the springboard for the much faster changes of the modern era. During the final centuries of the agrarian era the pace of change was already increasing. International GDP grew almost sixfold between 1000 and 1820, whereas hardly any growth had occurred at all during the previous millennium.

RISE OF COMMERCIAL SOCIETIES

Second, most historians would agree that the modern revolution is connected with the rise of more commercial

societies. From the Scottish economist Adam Smith onward economists have argued that a close link exists between innovation and commercial activity. Smith argued that large markets allow increased specialization, which encourages more precise and productive labor. Equally important, entrepreneurs buying and selling in competitive markets faced competition of a kind that landlords and governments of the agrarian era could usually avoid. To survive, entrepreneurs had to undercut their rivals by selling and producing goods at lower prices. To do that meant trading and producing with maximum efficiency, which usually meant finding and introducing the most up-to-date technology. As commercial exchanges spread, so did the number of wage workers: people who took their own labor to market. Because they competed with others to find work, wage workers also had to worry about the cheapness and productivity of their labor.

For these reasons the slow commercialization of economies that occurred throughout the agrarian era probably raised productivity by stimulating innovation. As the wealth, influence, and number of entrepreneurs and wage earners increased, the societies in which they lived became more open and receptive to innovation.

DEVELOPMENT OF A SINGLE GLOBAL NETWORK

Third, the linking of world zones into a single global network from the sixteenth century provided a sharp stimulus to commercial growth and technological innovation. In just a century or so the scale on which goods and ideas could be exchanged almost doubled, and a huge variety of new goods and ideas entered into global circulation. Maize, sugar, silver, coffee, cotton, tobacco, potatoes, and the productive and commercial expertise that went with these commodities were no longer confined to particular regions but instead were available throughout the world. Even the trade in people was internationalized. Before the sixteenth century the most active slave traders operated in the Islamic world, and most of their slaves came from Slavic or Turkic peoples to their north. From the sixteenth century European slavers began to capture or buy African

Like most of those who study history, he learned from the mistakes of the past how to make new ones. • A. J. P. TAYLOR (1906–1990)

slaves and to ship them to plantations in the Americas. For better or worse, such global exchanges stimulated commerce throughout the world.

WESTERN EUROPE'S EMERGENCE AS A GLOBAL HUB

Although change was rapid, it did not transform all parts of the world at once, and the order in which different regions were transformed had a profound effect on the course of modern history. This fact is the fourth factor contributing to the modern revolution. The societies of western Europe had been at the margins of the great trading systems of the agrarian era, but they were at the center of the global networks of exchange created during the sixteenth century because they controlled the ocean-going fleets that knit the world into a single system. Western Europe was better placed than any other region to profit from the vast flows of goods and ideas within the emerging global system of exchange. The European scientific revolution was, in part, a response to the torrent of new ideas pouring into Europe as a result of its expanded contacts with the rest of the world. Awareness of new ideas, crops, religions, and commodities undermined traditional behaviors, cosmologies, and beliefs and posed sharply the question of how to distinguish between false and true knowledge of the world. The reinvention and spread of printing with movable type ensured that new information would circulate more easily in Europe than elsewhere.

At the same time European states, in an environment of almost continuous warfare, desperately needed new sources of revenue; thus, they were keen to exploit the commercial opportunities created within the global economic system. They did so partly by seizing the resources of the Americas and using American commodities such as silver to buy their way into the markets of southern and eastern Asia, the largest in the world. The increasing scale of commercial and intellectual exchanges within Europe created an environment that was particularly open to innovation because European innovators could draw on the intellectual and commercial resources of the entire world. The primacy of western Europe during the early

stages of the modern revolution allowed it and the North American region to put their distinctive stamp on the modern revolution and to achieve a global hegemony that has so far lasted almost two centuries. Because of Europe's primacy English is the universal language of modern diplomacy and business rather than Persian or Chinese, and suits and ties rather than kaftans are worn in the United Nations.

OTHER FACTORS

Fifth, more particular factors must enter into any detailed explanation of the modern revolution. The peculiarly commercialized nature of European states undoubtedly helps explain their receptiveness to innovation, but geographical factors, such as climatic changes, or the presence of large, relatively accessible seams of coal in Britain and northwestern Europe, may also have shaped the timing and geography of the modern revolution.

Industrial Revolution: 1750–1914

These arguments suggest that the ingredients of the modern revolution were present in all parts of the world, even though its full impact first became apparent in northwestern Europe and the eastern seaboard of what became the United States. In this region technological change accelerated from the late eighteenth century. Familiar markers of change include the introduction and spread of more productive agricultural techniques, more efficient machines for spinning and processing cotton, the improved steam engine of the Scottish inventor James Watt, and the first locomotive. By the early nineteenth century contemporaries saw that something exceptional was happening. In 1837 the French revolutionary Auguste Blanqui (1805–1881) declared that an “industrial revolution” was under way in Britain and that it was as significant as

For more on these topics, please see the following articles:

Dictionaries and Encyclopedias p. 528 (v2)

Energy p. 646 (v2)

Enlightenment, The p. 660 (v2)

Industrial Technologies p. 981 (v3)



This line drawing by artist George Catlin is a depiction of himself painting a portrait during his travels in the American Indian country in the 1830s. It gives the viewer a sense of European views of native peoples.

cient way of exploiting the energy locked up in fossil fuels; it made available a seemingly endless supply of cheap energy, particularly in regions with ready access to coal. Immediately it lowered the cost of extracting coal by easing the task of pumping water from mine shafts; in combination with new spinning and weaving machines invented during the late eighteenth century, it also revolutionized the textile industry, the second-most-important sector (after agriculture) in most agrarian societies. To exploit these new technologies more efficiently, entrepre-

the political revolutions that had recently taken place in Europe and the Americas. By this time European levels of productivity had already overtaken those of the ancient superpowers of India and China.

THREE WAVES OF THE INDUSTRIAL REVOLUTION

The technological innovations of the Industrial Revolution spread in waves. Each wave spawned new productivity-raising technologies and spread industrialization to new regions. In the first wave, during the late eighteenth and early nineteenth centuries, the crucial changes occurred in Britain, although many of the innovations introduced there had been pioneered elsewhere. The most important changes were the introduction of efficient cotton-spinning machines and the Watt steam engine.

The steam engine provided for the first time an effi-

neers began to bring workers together in the large, closely supervised productive enterprises we know as factories.

In a second wave of innovations that occurred during the early and middle decades of the nineteenth century, steam engines were mounted on wheels to create the first locomotives. Railways slashed transportation costs over land, which is why they had a particularly revolutionary impact on the economies of large nations such as the United States and the Russian empire. In their turn, demand for coal, locomotives, rolling stock, and track stimulated coal and metal production and engineering. During the early nineteenth century many of these technologies spread to other parts of Europe and to the United States.

A third wave of innovations occurred during the second half of the nineteenth century. Industrial technologies

History is more or less bunk. It's tradition. We don't want tradition. We want to live in the present and the only history that is worth a tinker's damn is the history we make today. • HENRY FORD (1863–1947)

spread in North America, in other parts of Europe, and in Russia and Japan. Military humiliation at the hands of Western nations forced the governments of Russia and Japan to realize that they had to encourage industrialization if they were to survive because industrial power clearly enhanced military power. Steel, chemicals, and electricity were the most important new technologies during this wave of the industrial revolution, and new forms of organization brought banks and factories together in large corporate enterprises, the largest of which were in the United States. In Germany and the United States systematic scientific research began to play an important role in technological innovation, as did large corporations, and innovation began to be institutionalized within the structures of modern business and government.

By the end of the nineteenth century Britain was losing its industrial primacy to Germany and the United States: In 1913 the United States accounted for almost 19 percent of the world's GDP, Germany for 9 percent, and the United Kingdom for just more than 8 percent.

ECONOMIC DEVELOPMENTS

The first three waves of industrialization transformed levels of productivity. Between 1820 and 1913 the GDP of the United Kingdom increased by more than six times; that of Germany by nine times, and that of the United States by forty-one times. During the same period GDP per capita increased by 2.9 times in the United Kingdom, by 3.4 times in the lands that became Germany, and by 4.2 times in the United States. No earlier era of human history had witnessed such astonishing increases in productivity.

These growth rates were not matched in the rest of the world. On the contrary, the increasing economic and military might of the regions that industrialized first undermined the traditional agrarian economies of India,

For more on these topics, please see the following articles:

Colonialism p. 381 (v2)

Economic Growth, Extensive and Intensive p. 610 (v2)

Imperialism p. 952 (v3)

Liberalism p. 1133 (v3)

China, and the Ottoman empire. While the machine-produced textiles of the European and Atlantic powers undercut local products in other regions, their modernized armies conquered much of the world.

During the late nineteenth century interregional disparities in wealth and power increased sharply. Between 1820 and 1913 China's share of world GDP fell from 33 percent to 9 percent and that of India from 16 percent to 8 percent, while the share of the United Kingdom rose from 5 percent to more than 8 percent and that of the United States from almost 2 percent to more than 19 percent. By the end of the nineteenth century India was ruled by Britain; China was dominated commercially and even, to an extent, militarily by a conglomerate of European and Atlantic powers together with Japan; the Americas and Australasia were largely populated by migrants of European origin; much of Latin America was under the financial and commercial domination of Europe; and most of Africa and southeastern Asia had been incorporated within European empires. For the first time in human history political and economic inequalities between countries were becoming as striking as inequalities within countries. Global imperialism and the Third World are creations of the late nineteenth century.

DEMOCRATIC REVOLUTION

Economic changes were accompanied by profound social, political, and cultural changes. The peasant populations of agrarian societies were largely self-sufficient, but the urbanized wage-earning populations of industrialized societies, like the entrepreneurial classes that employed them, depended much more on structures of law and order and economic regulation that only states could provide. Governments, in turn, depended more on the cooperation of large sections of society as their tasks became more varied and complex. These changes explain the often violent renegotiation of relations between governments and subjects. The first modern democratic political systems emerged in the United States and western Europe during the turbulent second half of the eighteenth century, which the historian Robert Palmer called the "age of the democratic revolution." More democratic

Although the modern era is often thought of as more secular and rational than earlier eras, religion and faith continue to be important for many people. This photo shows a procession of pilgrims walking down the High Street of Little Walsingham, Norfolk, United Kingdom, carrying a statue of the Virgin and Child in 1997.

methods of rule granted political influence to wider sections of the population in exchange for increasing regulation as governments began to recruit into mass armies, to take detailed censuses, and to regulate life in factories, offices, and even households.

CULTURAL CHANGES

Cultural life was also transformed. Mass education spread literacy to a majority of the population in much of North America and Europe during the nineteenth century, while the emerging mass media gave citizens plenty to read and informed them of events in their own nation and the world at large. Mass education, combined with new forms of mass entertainment, also began to give citizens a more modern sense of a shared “national” identity. All religious traditions had to face the challenge posed by modern science, and most did so by incorporating some aspects of a new scientific view of reality while rejecting others. The spectacular successes of nineteenth-century science raised the prestige of science and challenged traditional worldviews.

Particularly challenging was the theory of evolution put forward by the English naturalist Charles Darwin (1809–1882), which seemed to imply that life itself might be the product of blind forces. Yet, precisely because it relied so much on rational explanations, the scientific worldview could not offer the spiritual consolation of traditional religions, which is why the challenge of science, far from destroying traditional religions, seems to have stimulated new forms of religious activity, such as evangelical forms of Christianity.

Outside the Atlantic core region the indirect effects of the Industrial Revolution were largely destructive as the growing political, commercial, and military power of Europe and North America threatened traditional political and economic structures and eroded faith in ancient ways of thinking. Rapid population growth, land short-



age, increased taxation, and new opportunities in the towns undermined village life in most of the world. However, as socialists pointed out, conditions in early industrial towns were often worse than those in the villages. Together, the slow erosion of peasant lifeways and the appalling conditions in early industrial towns created explosive social tensions in all industrializing societies.

Governments outside the core region of the early Industrial Revolution had to face the impossible challenge of trying to match European economic and military performance without undermining the traditional social and cultural structures on which their own power was based. The transition was bound to be painful because the dominant politics of the agrarian era had been based primarily on traditional forms of landlordship rather than on commerce; yet, people increasingly realized that industrialization was linked closely with commercial activity. Not surprisingly, the creation of modern forms of government frequently led to the violent breakdown of traditional social structures and systems of rule. Japan

I am inclined to think that history pays its way largely in the personal satisfaction of sitting on the fence and enjoying vicariously the trials and tribulations of men and times now ended. • AVERY O. CRAVEN (1885–1980)

was one of the few traditional societies that managed to make a transition to a modern industrial economy without destroying the fabric of its society.

By 1900 many features of the modern revolution were apparent throughout the North Atlantic core region, and, for better or worse, many other parts of the world were also beginning to feel its impact on lifeways, economies, governments, and ways of thinking.

Twentieth-Century Crisis: 1914–1945

Between 1913 and 1950 the engine of growth that had transformed so much of the world seemed to break down. Global rates of growth of GDP slowed from 1.30 percent per annum between 1870 and 1913 to 0.91 percent between 1913 and 1950. The slowdown affected all the core regions of the Industrial Revolution but was even more pronounced in the former agrarian colossi, China and India. The apparent exception to the rule was Russia, whose annual growth rate rose from 1.06 percent during the late czarist period to 1.76 percent between 1913 and 1950.

The slowdown was caused in part by a breakdown in the international banking and trading systems that had helped spread the Industrial Revolution. Between 1870 and 1950 the proportion of world production that was traded internationally actually fell. Part of the problem was that the governments of industrializing countries were still learning how best to manage rapid economic growth, and all too often, like the great agrarian empires of the past, they treated growth as a zero-sum game (a situation in which a gain for one side entails a loss for the other side) that could be won only by excluding rivals

For more on these topics, please see the following articles:

Colonialism p. 381 (v2)

Communism and Socialism p. 401 (v2)

Fascism p. 733 (v2)

Genocide p. 815 (v2)

World War I p. 2079 (v5)

World War II p. 2085 (v5)

from protected markets. The burst of imperialism during the late nineteenth century was the most obvious expression of this rivalry; another was the spread of protectionism (protection of domestic producers through restrictions on foreign competitors), and a third was the emergence of a system of defensive alliances in Europe, which helped turn a crisis in the Balkans into a global war. Distrust and rivalry among the major industrial powers clogged the arteries of international exchange that were so crucial as a source of economic growth and political stability.

After the assassination of Archduke Francis Ferdinand, the heir to the throne of the Austro-Hungarian empire, on 28 June 1914, Austria invaded Serbia, Russia intervened to defend Serbia, and Germany declared war on Russia, which dragged Russia's allies, Britain and France, into the war. The global reach of European colonial and commercial networks dragged other regions into the war. German colonies in Africa, the Pacific, and China were seized by French, British, and Japanese armies; troops and supplies came to Europe from present and former colonies in India, southeastern Asia, Africa, Australasia, and North America as well as from semicolonies such as Argentina. In 1917 the United States entered the war against Germany.

Nineteenth-century military innovations ensured that World War I would be particularly bloody. New weapons included machine guns, tanks, airplanes, and chemical weapons such as mustard gas, which could burn out the internal organs of its victims. Ironically, medical improvements kept more troops at the front, only to be slaughtered in the thousands by machine guns or artillery in often futile raids on enemy positions. Modern industrial states mobilized for "total war" effectively as they took control of national economies to supply their armies. The home fronts—where women replaced men on the farms, in munitions factories, or on the railways—were as vital to success as the armies. Indeed, the role of women during World War I was a major factor in the rapid spread of women's suffrage during the postwar years. World War I was not the first total war of the industrial era—the U.S. Civil War deserves that title more—but it demonstrated



Extract from *All Quiet on the Western Front*

Since its publication in 1929, *All Quiet on the Western Front* has remained a classic novel about the personal anguish of soldiers in war. German writer Erich Maria Remarque (1898–1970) based the novel on his own experiences as a soldier during World War I. Below is one of the most profound quotes from the book.

But now, for the first time, I see you are a man like me. I thought of your hand-grenades, of your bayonet, of your rifle; now I see your wife and your face and our fellowship. Forgive me, comrade. We always see it too late. Why do they never tell us that you are poor devils like us, that your mothers are just as anxious as ours, and that we have the same fear of death, and the same dying and the same agony—Forgive me, comrade; how could you be my enemy?

Source: Remarque, E. M. (1929). *All Quiet on the Western Front* (A. W. Wheen, Trans., p. 223). New York: Fawcett Crest.

even more powerfully the appalling scale and destructiveness of industrialized warfare, and it was the first truly global war of the modern era.

GLOBAL UPHEAVAL

A punitive peace treaty negotiated in Versailles, France, and the failure of the newly created League of Nations ensured that the rivalries that had caused World War I did not go away. In 1929 the international trading and banking system finally collapsed, leading to a depression that affected all the major capitalist powers, as well as the Asian, Latin American, and African countries that supplied them with raw materials. The Great Depression seemed to confirm the socialist prediction that the capitalist system would eventually break down. Many governments retreated even further into autarchy (national economic self-sufficiency and independence) as they saw themselves competing for a dwindling share of world resources and markets.

In 1933 in Germany a fascist government emerged led by Adolf Hitler (1889–1945). Hitler was determined to reverse the losses of World War I, if necessary through

conquest. Fascism also took hold in Italy, the birthplace of fascism's founder, Benito Mussolini (1883–1945), as well as in Spain, Brazil, and elsewhere. Fascism and socialism both reflected a deep disillusionment with the liberal capitalist ideologies of the late nineteenth century, but whereas fascists anticipated an era of national and racial conflict, in which the fittest and most powerful would triumph, revolutionary socialists framed the conflict in terms of class war that would pit capitalism against socialism.

The appearance in Russia of a Marxist-inspired state determined to overthrow capitalism was another apparent sign of the breakdown of nineteenth-century capitalism. Russia's czarist government had encouraged industrial growth but had failed (unlike the Meiji government in Japan) to incorporate within its ruling structures the entrepreneurs who would be needed to make a success of industrialization. Eventually the rapid growth of an urban proletariat (working class) and the impoverishment of increasing numbers of peasants generated a social crisis that, when combined with military defeat during the Russo-Japanese War and the huge costs of participation in World War I, led to the collapse of the Russian imperial state. Traditional elites reacted too passively to the crisis, which allowed the Bolsheviks, led by Vladimir Lenin (1870–1924), to seize power and hold on to it during a brutal civil war (1918–1920).

The Bolsheviks were radical Marxists, committed to the overthrow of world capitalism and its replacement by a society in which productive resources such as the land, banks, and all large enterprises would be owned collectively. Under Lenin's successor, Joseph Stalin (1879–1953), the Soviet government took decisive and brutal steps to build up a noncapitalist industrial society capable of challenging the might of its capitalist rivals. Employing methods of state management pioneered during World War I, the Soviet government began to manage and coordinate the entire Soviet economy, leaving no significant role to market forces. To manage rapid industrialization and rearmament, the Soviet government created a huge, powerful, and coercive state apparatus, willing and capable of acting with extreme brutality where nec-

Hegel says somewhere that all great events and personalities in world history reappear in one fashion or another. He forgot to add: the first time as tragedy, the second as farce. • KARL MARX (1818–1883)

essary. For a time people thought the new system might match the economic and military power of the major capitalist states. During the 1930s and again during the 1950s rates of economic growth were more rapid in the Soviet Union than elsewhere (although the lack of market prices in the Soviet command economy makes monetary comparisons difficult).

REARMAMENT

During the 1930s, in an international climate of increasing tension, all the major powers began to rearm. World War II began with attempts by Japan and Germany to create their own land empires. Japan invaded Manchuria in 1931 and China proper in 1937; Germany's expansionist drive led to war in Europe in 1939 after Germany invaded Poland. In 1941 the United States, now the largest economic power in the world, entered the war after Japan's preemptive attack on Pearl Harbor, and the Soviet Union entered the war after being invaded by Germany. World War II was fought in the Pacific and in eastern and southeastern Asia as much as in Europe, but eventually the economic and military power of the United States and the colossal mobilizational efforts of the Soviet Union helped turn the tide against the Axis powers (Germany, Japan, and Italy). World War II was even crueler than World War I. Sixty million people may have died—about 3 percent of the world's population at the time.

The war ended with the use of the most terrible weapon yet invented—the atomic bomb. The first atomic bombs were dropped by the United States on the Japanese cities of Hiroshima and Nagasaki in August 1945. Most of the casualties of World War II were civilians as the aerial bombing of cities became, for the first time, a recognized weapon of modern warfare. The extreme brutality of the war found its most potent symbol in the systematic murder by Hitler's Nazi Party of almost 6 million Jews in what has come to be known as the "Holocaust."

By the end of the war Europe no longer dominated the global economic system. The new superpowers were the United States and the Soviet Union. Each had its own allies and clients, and each represented a different path to modernity. The size and power of the Communist bloc

were enhanced by the incorporation of much of eastern Europe and by the emergence in 1949 of a Communist-dominated China led by Mao Zedong (1893–1976). By 1950 almost one-third of the world's population lived under Communist governments. Throughout this period economic growth was more rapid outside of Europe, particularly in the United States, the Soviet Union, and Japan, but also in regions such as Latin America.

The emergence of powerful anticolonial movements in southeastern Asia, India, Africa, and elsewhere marked the beginning of the end of European imperialism. In India the Indian National Congress, established in 1885, became a powerful supporter of independence, and in Mohandas Gandhi (1869–1948) it found an inspirational and creative leader whose nonviolent protests forced Britain to grant independence to the newly created states of India and Pakistan in 1947.

Despite the crises of the early twentieth century, socialist predictions of the death of capitalism were premature. Technological innovation was rapid throughout the period; the internal combustion engine entered mass production, aviation emerged (first as a weapon of war and then as a new form of commercial and personal transportation), and chemical substitutes for textiles and rubber were first produced. This was also the era of sonar, of nuclear power, and of oil. It also was an era of fundamental scientific breakthroughs, particularly in physics.

Other developments helped ensure that the capitalist engine of growth would revive and that the frenetic pace of economic growth of the nineteenth century would eventually be resumed. The managerial principles that would help revive growth first became apparent in the United States. Two developments were particularly important: mass production on assembly lines, pioneered by Henry Ford (1863–1947) in 1913, and mass consumerism, a phenomenon whose importance first became apparent during the 1920s as ordinary people began to gain access to modern goods such as cars, telephones, and radios.

BUYING INTO CONSUMERISM

Mass consumerism eventually provided a solution to the fundamental problem of underconsumption, which had

History gets thicker as it approaches recent times. • A. J. P. TAYLOR (1906–1990)

haunted producers during the nineteenth century when, as productivity rose, they had greater difficulty marketing what they produced. From at least the 1870s people had realized that capitalist economies are prone to periods of boom and bust as productivity outstrips market demand. The business cycles of capitalist economies were the modern equivalents of the agrarian era's Malthusian cycles of growth and decline, but, in a striking contrast, the business cycle was driven by overproduction, whereas Malthusian cycles had been driven largely by underproduction. During the early twentieth century people realized that raising demand might be a more promising way of ensuring long-term growth than seeking protected markets.

However, for demand to rise, governments and employers had to ensure that consumers had sufficient cash in their pockets to purchase goods and services. During the depression of the 1930s economists such as John Maynard Keynes (1883–1946) argued that governments could help revive capitalist economies not by cutting wages further, but rather by boosting consumption through devices such as the provision of unemployment payments. However, governments were already experimenting with such devices. In the United States the "New Deal" of the 1930s pumped large amounts of money into the economy through government programs mostly designed to boost spending by creating employment through the building of new infrastructure such as roads and dams.

For capitalist governments mass consumption offered another advantage that undercut some of the anticapitalist arguments of Marxism and its offshoots. During the twentieth century people realized that populations with access to increasing material wealth were unlikely to turn into the sort of revolutionary proletariat that the German political philosopher Karl Marx had envisaged as the gravediggers of capitalism. Mass consumption was the capitalist antidote to revolution.

CRISIS AND INNOVATION

In many fields the crisis period of 1914–1945 was also a period of cultural revolution. The theory of relativity advanced by the U.S. physicist Albert Einstein (1879–



This line drawing by the poet ee cummings shows the austerity typical of so-called modern art.

1955) and quantum mechanics, developed by such scientists as Niels Bohr (1885–1962), Erwin Schrodinger (1887–1961), Werner Heisenberg (1901–1976), and Max Born (1882–1970), challenged earlier mechanistic models of the universe, while the Austrian neurologist Sigmund Freud (1856–1939), by showing the importance of unconscious psychological drives, challenged

Examine the history of all nations and all centuries and you will always find men subject to three codes: the code of nature, the code of society, and the code of religion . . . [T]hese codes were never in harmony. • DENIS DIDEROT (1713–1784)

faith in the role of reason in human affairs. New art forms, such as cinema, brought artistic realism into mass culture and challenged artists and writers to experiment with new, less realistic forms of expressionism, from the cubism of painters such as Pablo Picasso (1881–1973) to the dream narrative of *Finnegans Wake* by James Joyce (1882–1941).

The new technologies of mass culture, including radio, newspapers, and particularly the cinema, offered new ways of influencing the ideas, attitudes, and fantasies of people throughout the world, and governments as well as advertisers came to appreciate their power. The Soviet government was particularly creative in using the mass media to spread its ideas. The new mass media also helped create a mass culture that could challenge the hegemony of traditional high culture. Outside of the industrial heartland, the revival of traditional religious and artistic traditions, such as those of Hinduism and Buddhism, began to play an important role in creating new national cultures that could challenge the cultural hegemony of the North Atlantic region.

Contemporary Period: 1945–Present

After World War II the capitalist engine of growth roared to life again to generate the most rapid economic growth in world history. From 0.91 percent per annum between 1913 and 1950, global rates of growth of GDP rose to 2.93 percent between 1950 and 1973 before falling to the more modest but still impressive rate of 1.33 percent between 1973 and 1998.

The international economic order was revived and restabilized by expanding markets, by massive reconstruction aid from the United States, and by the creation of global regulatory institutions such as the United Nations (in 1945) and the International Monetary Fund (in 1947). After falling between 1913 and 1950, the proportion of goods produced for international markets tripled between 1950 and 1995. A revival in international trade and the spread of mass consumerism, first in the United States and then in Europe and Japan, stimulated economic growth in all the leading capitalist countries. For

the first time significant numbers of consumers in Europe and Japan began to buy private cars, televisions, and radios and even exotic foreign holidays, made possible by the reduced cost of air transportation. A new wave of innovations in electronics, many stimulated by wartime research programs, ushered in the electronic revolution of the 1980s and 1990s, and innovations in biology, including the discovery of the structure of deoxyribonucleic acid (DNA, the carrier of genetic information), spawned new techniques of genetic engineering whose implications are still unclear.

Capitalist governments became increasingly adept at sustaining growth by stimulating consumption and by seeking the right balance between intervention and laissez-faire (a doctrine opposing governmental interference in economic affairs). Slumps during the early 1970s and the late 1990s demonstrated that the business cycle has never been completely tamed. Nevertheless, many of the protectionist illusions of the late nineteenth century were shed as governments realized that in a world of rapid global growth, the wealth of individual nations (even the most powerful) usually depends more on global economic growth than on the possession of protected markets. A clearer understanding of the economic and political realities of modern capitalism explains the

For more on these topics, please see the following articles:

American Empire p. 82 (v1)
 Climate Change p. 363 (v1)
 Cold War p. 376 (v2)
 Consumerism p. 435 (v2)
 Globalization p. 849 (v3)
 Green Revolution p. 870 (v3)
 Human Rights p. 939 (v3)
 Mass Media p. 1203 (v3)
 Postcolonial Analysis p. 1502 (v4)
 Progress p. 1514 (v4)
 Religious Freedom p. 1574 (v4)
 Russian–Soviet Empire p. 1638 (v4)
 Social Welfare p. 1737 (v4)
 United Nations p. 1916 (v5)
 Urbanization p. 1925 (v5)

But even regarding History as the slaughter-bench at which the happiness of peoples, the wisdom of States, and the virtue of individuals have been victimized—the question involuntarily arises—to what principle, to what final aim, these enormous sacrifices have been offered. • G. W. F. HEGEL (1770–1831)

decision of U.S. governments to finance postwar reconstruction in Europe (through the Marshall Plan) and in Japan, even if that meant turning former enemies into commercial rivals. Partly in this spirit, and partly under pressure from indigenous anticolonial movements, European governments surrendered the empires they had conquered during the late nineteenth century.

During the forty years after 1945 roughly a hundred nations achieved independence from their European overlords, and another batch of new nations emerged after the collapse of the Soviet Union in 1991. By 2004 the United Nations had 191 members.

Industrialization spread beyond the core regions of the late nineteenth century, partly with the active support of the major capitalist powers. Economic growth was particularly rapid until the late 1990s in eastern and south-eastern Asia, in particular in South Korea, Taiwan, Malaysia, Thailand, Hong Kong, and Singapore, all of which were influenced by the Japanese model of growth.

ROCKETS AND RUBLES

Global economic growth occurred despite the partitioning of the world into two major power blocs. The capitalist and Communist powers challenged each other militarily, economically, and politically. For several decades these rivalries threatened to ignite a third world war, fought this time with nuclear weapons. However, the Cold War was also a contest for economic and political hegemony. The two blocs offered rival paths to economic growth, and for perhaps three decades people did not know whether the command economies of the Communist world or the capitalist economies of the West would generate the most rapid growth, although both sides agreed that during the modern era economic growth is the key to political and military success.

After Stalin's death in 1956 Soviet living standards began to rise as his successors steered investment toward consumer goods and housing. During the 1950s the Soviet Union enjoyed a string of successes that seemed to demonstrate the technological dynamism of its command economy. These successes included the creation of Soviet nuclear weapons and missiles, the launching of the

first space satellite, *Sputnik*, in October 1957, and the launching of the first human, Yuri Gagarin (1934–1968), into orbit in 1961.

Then, during the 1970s, Soviet growth rates began to slow, and disillusionment set in as Soviet citizens realized that their living standards were well behind those of the major capitalist countries. Although the command economy could indeed innovate when massive resources were devoted to large prestige projects, without the constant pressure of competitive markets it could not generate the trickle of petty innovations that drove productivity growth in the capitalist world. By the 1980s it was clear that the Soviet economy was failing to incorporate the new electronic technologies that were revolutionizing capitalist economies and societies. Soviet generals understood that this fact was a military as well as a technological disaster for the Soviet Union.

The failures of the Soviet economy tell us much about the driving mechanisms of the modern revolution. Soviet planners understood from as early as the 1950s that the weaknesses of the command economy derived from the lack of domestic competition and the absence of any effective equivalent of the profit motive. Even during the 1930s high rates of growth derived more from a massive, and highly coercive, mobilization of labor and resources than from real gains in efficiency. During the mid-1980s a new leader, Mikhail Gorbachev (b. 1931), admitted that the Soviet economy was grinding to a halt because it could no longer keep mobilizing new resources, as it had during the 1930s and 1940s. The Soviet system collapsed because its mobilizational strategy of growth, like that of traditional agrarian empires, although effective in military crises, stifled innovation. The failure of the Soviet command economy provides ironic support for Karl Marx's claim that capitalism is the motor of modernity.

CHINA ADAPTS

Communist China offers an apparent exception that proves the rule. During the 1950s the government of Mao Zedong tried to industrialize using the methods of Stalin. However, the economic and social disasters of the Great Leap Forward (1958–1961, a period in which the

The Marshall Plan

In a speech delivered on 5 June 1947 by U.S. Secretary of State George C. Marshall at Harvard University, Marshall laid out what would become known as the Marshall Plan. The United States was willing to offer up to \$20 billion in relief to a war-torn Europe struggling to survive after a brutal winter if the Western European nations would cooperate as a single economic unit. (Marshall also offered aid to the Soviet Union and its allies, which was rejected by the Soviet leader Joseph Stalin.) As evidenced by Marshall's words in the extracts that follow from his speech, the plan was crucial to the survival and growth of post-World War II Europe.

I need not tell you gentlemen that the world situation is very serious. That must be apparent to all intelligent people. I think one difficulty is that the problem is one of such enormous complexity that the very mass of facts presented to the public by press and radio make it exceedingly difficult for the man in the street to reach a clear appraisal of the situation. Furthermore, the people of this country are distant from the troubled areas of the earth and it is hard for them to comprehend the plight and consequent reaction of the long-suffering peoples, and the effect of those reactions on their governments in connection with our efforts to promote peace in the world.

[...]

The truth of the matter is that Europe's requirements for the next 3 or 4 years of foreign food and other essential products—principally from America—are so much greater than her present ability to pay that she must have substantial additional help, or face

economic, social, and political deterioration of a very grave character.

The remedy lies in breaking the vicious circle and restoring the confidence of the European people in the economic future of their own countries and of Europe as a whole. The manufacturer and the farmer throughout wide areas must be able and willing to exchange their products for currencies the continuing value of which is not open to question.

Aside from the demoralizing effect on the world at large and the possibilities of disturbances arising as a result of the desperation of the people concerned, the consequences to the economy of the United States should be apparent to all. It is logical that the United States should do whatever it is able to do to assist in the return of normal economic health in the world, without which there can be no political stability and no assured peace. Our policy is directed not against any country or doctrine but against hunger, poverty, desperation, and chaos. Its purpose should be the revival of working economy in the world so as to permit the emergence of political and social conditions in which free institutions can exist. Such assistance, I am convinced, must not be on a piecemeal basis as various crises develop. Any assistance that this Government may render in the future should provide a cure rather than a mere palliative. Any government that is willing to assist in the task of recovery will find full cooperation, I am sure, on the part of the United States Government.

[...]

Source: *Congressional Record* (June 30, 1947). Retrieved September 8, 2004, from <http://usinfo.state.gov/usa/infousa/facts/democrac/57.htm>

Chinese government tried to force the pace of industrialization by abolishing all private property) and the chaos of the Cultural Revolution (1966–1976, a period of internal chaos during which millions were accused of anticommunist activities and subjected to exile, banishment, or death), combined with the growing rift between China and the Soviet Union, encouraged the Chinese government to retreat from the Soviet ideal of total state control of the economy. After Mao's death in 1976 his

successors cautiously reintroduced elements of a market economy, and as entrepreneurial activity spread in China, economic growth accelerated. Capitalism was never entirely destroyed in China (as it had been in the Soviet Union), which is why, despite the survival of its Communist government, its economy has shifted with some success toward a competitive market economy.

Throughout the world economic growth and the many changes that have come with growth transformed lifeways

*Time present and time past
Are both perhaps present in time future,
And time future contained in time past.*

during this period. Mass education was introduced in most of the world; thus, a majority of people in most countries were introduced to the basics of literacy. More and more people lived in huge cities as improved medical, sanitary, and educational services and increasing opportunities for wage work lured people from the villages. For the first time in human history cities became healthier places than villages, at least where they were supplied with the basic amenities of clean water, sanitation, medical services, transportation, and electricity. Improved medical care explains the astonishing fact that in just thirty-five years (1955–1990), the average life span of human beings increased from about thirty-five years to fifty-five years.

Urbanization transformed gender relations as families adapted to an urban world in which women's salaries were as vital as those of men. Women have become increasingly visible in government, in education, in medicine, and in science. Yet, true gender equality, like economic equality, still seems a remote goal. Worldwide in 1990 about eighty women were in secondary education and sixty-five in tertiary education for every hundred men, and only about sixty women were in paid employment for every hundred men.

During the 1980s and 1990s new forms of electronic communications and transportation and the reintegration of the Soviet Union (and its successor states) and China into the capitalist world economy bound the world together more tightly than ever before. This new pulse of global integration has come to be known as "globalization." Globalization stimulated economic growth in most of the core industrial economies and many newly industrialized countries, although many of the world's poorer countries found the costs of competition too high and fell further behind, particularly in parts of Africa and Latin America. For better or worse, globalization also brought the world's many cultures into closer contact. As television and radio became more common even in Third World countries, the cultural norms and consumerist values of the most industrialized countries became commonplace throughout the world.

COCA-COLA CULTURE AND THE BACKLASH

The influence of the United States was particularly pervasive as consumer goods such as Coca-Cola and U.S. styles in clothing, music, sports, and entertainment became familiar throughout the world. Yet, Western influences have also generated a powerful backlash as governments and citizens in other parts of the world have tried, with varying degrees of success, to defend traditional cultural and religious values. The emergence of new forms of radical anti-Westernism is merely one reflection of growing resistance to Western values.

Resistance to Western values has been fueled by increasing global inequality. In 1960 the wealthiest 20 percent of the world's population earned about thirty times as much as the poorest 20 percent; in 1991 the wealthiest 20 percent earned sixty-one times as much. The successes of the most highly industrialized countries threw a harsh spotlight on the poverty of less industrialized regions, highlighting inequalities in income and in access to medical and educational resources and to necessities such as clean water and air. Although industrialization spread to more and more countries during the twentieth century, in too many cases it was incomplete or narrowly based on the trade in specialist commodities such as coffee or oil or managed by corrupt militaristic governments that skimmed off profits or spent them on armaments rather than reinvesting them in growth.

Although the wealth and the technologies exist to provide all humanity with basic medical care, clean water, and adequate food, millions still die from famine or water-borne diseases in the least industrialized regions of the world, and lack of appropriate education and services has contributed to the rapid spread of AIDS, particularly in southern Africa, where in some countries almost one-quarter of the adult population had AIDS during the mid-1990s. Peasants have become increasingly marginalized as traditional rural lifeways have been undermined by overpopulation, the fragmentation of landholdings, and competition from cheap overseas imports.

In much of the world the modern era has included the

*If all time is eternally present
All time is unredeemable.*

• T.S. ELLIOT (1888–1965)

death of the peasantry, the class to which most humans had belonged throughout the agrarian era. The collapse of Communism has created Third World conditions in much of the former Communist world as well. For many people, even at the beginning of the twenty-first century, the modern revolution must still seem like a distant dream. Directly or indirectly, the deep economic, political, and cultural inequalities of the modern world likely will continue to fuel bloody guerrilla conflicts in which small groups with modern weapons attempt to resist the cultural, economic, and military power of the wealthiest capitalist states.

BURNING THE CANDLE

Whereas many people have seen the dire conditions in the world's poorest countries as a sign of those countries' backwardness, others have seen such conditions as a warning of future dangers. During the second half of the twentieth century people were increasingly aware that the rapid population growth and increasing consumption of the modern era had put new pressures on the whole biosphere (the part of the earth's surface, seas and atmosphere inhabited by living things). Indeed, in *Something New Under the Sun*, John McNeill argued that, in the long perspective, the changing human relationship with the environment may turn out to be the most important of all the changes that occurred during the twentieth century.

Population growth accounts for much of the impact as cities have gobbled up farmland and forest land, as roads and highways have paved over more land, and as Third World farmers have cleared forest lands to eke out a living. However, late during the twentieth century people realized that rates of population growth were slowing throughout the world as urbanization, increasing education, and improved services simultaneously reduced the pressure to have large families and raised their cost. At present, it seems likely that global populations will level out at 9 to 10 billion toward the end of the twenty-first century.

On the other hand, consumption levels are rising in

much of the world. As industrialization spreads to China, India, Africa, and much of Latin America, and as more and more consumers begin to expect the material living standards currently enjoyed in Europe and North America, human pressure on the environment will increase even as population growth slows. Environmental strains take many forms. Habitats invaded by humans are no longer available to other species; thus, current rates of extinction may be as high as during the most rapid extinction episodes of the last 600 million years.

Some resources are already being used at dangerously high levels; this is particularly true of fisheries and clean water. However, the most dangerous of all these threats may be the impact on the atmosphere of burning large quantities of fossil fuels. Carbon dioxide is one of several greenhouse gases—gases that hold in the sun's heat and therefore tend to raise the average temperature of the atmosphere. Deforestation may have increased global carbon dioxide levels during the agrarian era, but the burning of fossil fuels since the Industrial Revolution has greatly increased these levels, from approximately 280 parts per million in 1800 to approximately 350 in 2000, and levels could reach 550–660 parts per million by 2150. The exact consequences of this human manipulation of the atmosphere are not yet clear, but they are likely to cause significant and perhaps rapid changes in global climatic patterns—changes as great as those that occurred at the end of the last ice age.

Modern Era in World History

In 1969, by landing on the moon, human beings took the first, hesitant steps toward leaving their home planet. These steps brought into focus some of the major changes of the modern revolution, reminding humans that the increasing power and complexity of human societies were bought at a price and came with dangers. Humans now have the power to destroy themselves and to do much damage to the planet. Our increased power clearly has brought responsibilities for which we are ill prepared, and the great complexity of the modern global

The whole of contemporary history, the World Wars, the War of Dreams, the Man on the Moon, science, literature, philosophy, the pursuit of knowledge—was no more than a blink of the Earth Woman's eye. • ARUNDHATI ROY (B. 1960)

community has created new forms of vulnerability and the fearsome prospect of a major collapse, similar to the collapses suffered in the past by many overambitious irrigation-based societies. On the other hand, the immense sophistication and scale of the knowledge available today hold out the promise of a managed transition to a more sustainable relationship with the biosphere.

What remains unclear, then, is whether the modern revolution will lead to the emergence of a new global system capable of relative ecological, economic, and political stability, or whether the accelerating change of the modern era is the prelude to a sudden, sharp collapse that will drive many parts of the world back to the productivity levels of the early agrarian era, if not even further. Perhaps the fundamental paradox of the modern revolution is that on the one hand human control over the biosphere has increased spectacularly; yet, on the other hand we have not yet shown that we can use that control in ways that are equitable and sustainable. We must wait to see whether the astonishing collective achievements of our species will prove ephemeral or enduring.

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